ENFIELD INLAND WETLAND & WATERCOURSES AGENCY

TUESDAY, MARCH 2, 2010

REGULAR MEETING @ 7:00 PM

PUBLIC HEARING to follow (if applicable)

Council Chambers

ENFIELD TOWN HALL
820 ENFIELD STREET
ENFIELD, CT

INFORMATION PACKET

AMENDED AGENDA
MEETING OF THE
ENFIELD INLAND WETLANDS AND WATERCOURSES AGENCY
TUESDAY, March 2, 2010 – **7:00 pm**
REGULAR MEETING
*****Council Chambers*****
********* ENFIELD TOWN HALL *********
*** 820 ENFIELD STREET***
** ENFIELD, CT 06082 **

REGULAR MEETING

1. Call to Order
2. Roll Call
3. Pledge of Allegiance
4. Executive Session

(Matters regarding specific employees, pending litigation, acquisition of real estate and / or matters exempt from disclosure requirements)

5. Public Hearing
   a. **IW-534– Enfield Properties** – is requesting a permit to construct two office buildings and five residential apartment buildings 153 South Road and adjacent lots (Map 55, Lots 80, 93 & 99), within the regulated area. Submitted 12/15/09, received 12/15/09, PPE 12/29/09, MPHCD 2/23/10, **EMPHCD 2/2/10**.
   b. **(TO COMMENCE 3/16/10) IW-535 – T.P. Rentals, LLC** – is requesting an amendment to the Town of Enfield Inland Wetlands and Watercourses Map for the property located on the south side of Hazard Avenue, immediately east of 150 Hazard Avenue (Map 74, Lot 118). Submitted 1/19/10, received 02/02/10, PPE 02/16/10, MAD 4/8/10, **MPHCD 4/6/2010.**
6. Call to Order of Regular Meeting
7. Public Participation - Issues of concern not on the agenda
8. Correspondence
   a. IW-528 AB Container Email
   b. DEP Training Program Classes Handout
   c. Update – 123 Weymouth Road
   d. Map-Reading and Watershed Delineation Skills for Inland Wetland Commissioners Handout
   e. Porous Pavements Q & A Article
9. Commissioner's Correspondence
   a. Site Visit Updates
10. Approval of Minutes –January 19, 2010, February 2, 2010 & February 16, 2010
11. Wetlands Agent Report

13. New Business

    a. **IW-536 – Richard Lanagan -** is requesting a permit to clear trees and install a shed on 201 State Street (Map 35, Lot 248) within the regulated area. Clearing activities have already been conducted. Submitted 2/22/10, received 03/02/10, PPE 3/16/10, **MAD 4/6/10.**

14. New Applications to be Received

    a. Applications to be received after Town deadline for Agenda

15. Other Business

    a. IWWA Fines Ordinance

    b. IWWA Fee Schedule

    c. IWWA Regulation Revisions

    d. **Next regular meeting is Tuesday, March 16, 2010 at 7:00PM in the Council Chambers.**

16. Adjourn

Acronym Key for Dates:

Submitted	= Day it was Logged in by the Appropriate Town Office.
Rec'ed	= Received (Date of First Regular Meeting after the day of submission or 35 days, which ever is sooner)
PPE	= Petition Period Ends (14 Days from Receipt)
MAD	= Mandatory Action Date (65 Days from Receipt)
EMAD	= Extended Mandatory Action Date (Any combination up to 65 days from original MAD)
MPHCD	= Mandatory Public Hearing Closing Date (35 Days from opening of the public hearing)
EMPHCD	= Extended Mandatory Public Hearing Closing Date (Any combination up to 65 Days from first MPHCD)
MPHAD	= Mandatory Public Hearing Action Date (35 Days after close of the public hearing)
EMPHAD	= Extended Mandatory Public Hearing Action Date (Any combination up to 65 Days from first MPHAD)

*Applicant can consent to extend the time frame for any of the steps but the total of all extensions together cannot exceed 65 days

PUBLIC HEARINGS

IW 534 – Enfield Properties

IW 535 T.P. Rentals, LLC

IW 534 – Enfield Properties

820 Enfield Street, Enfield, CT 06082
Phone: (860) 253-6355 Fax: (860) 253-4729
www.enfield-ct.gov

Town of Enfield
Planning Department

Memo

To: Enfield Inland Wetlands and Watercourses Agency

From: Katie Bednaz, Assistant Town Planner/Wetlands Agent

CC:

Date: February 24, 2010

Re: **Agent Review for IW# 534 – South Road**

The following are my review comments and observations regarding the Inland Wetland and Watercourses Application IW-534 for the Proposed Elderly Housing and Commercial Development. The full set of plans for the project were reviewed entitled "Proopsed Elderly Housing and Commercial Development, South Road, Enfield, CT, Inland Wetlands Permit Application", sheets: MA-1, LA-1, LA-2, LS-1 thru LS-4, GR-1, GR-2, UT-1, UT-2, PH-1, SD-1 thru SD-5, NT-1 and 1, dated 12/11/09, revised to 02/10/10. In addition the application package, Wetlands Assessment Report and Stormwater Management Report Supplement which are located in the application file were reviewed.

1) The Inland Wetlands application number should be located on all plan sheets.
2) Sheet LA-1 specifies signage stating "Snow Stockpiling Prohibited in This Area". It may be more appropriate to designate the snow stockpiling areas with signage, noting on the sign that snow is to only be stored in specified areas. This may reduce the number of signs required.
3) The direct impacts to wetlands should be clearly shown on the plans with labels or a table that identifies the square footage of disturbance.
4) The Landscaping Plan shows the wetland creation/restoration/enhancement area plantings.
    a. The overall Landscape Plan (LS-1 and LS-2) should have each mitigation area clearly labeled with its designation.
    b. LS-4 lists the number and species of plants to be installed in each mitigation area. LS-1 through LS-3 should reflect how many of which plants should be installed in each location. Currently the plans only show "Low Shrub Mass with Perennial Wildflower Bed", etc. It is understood that the designation of these planting will be directed by the on-site wetland scientist to some extent. At a minimum, the number of woody vegetation to be installed in each location should be specified with generic type (i.e. trees, shrubs) of vegetation. Exact species can be directed by the on-site wetland scientist.
    c. Wetland restoration/enhancement areas 'A and B' and wetland creation 'A' has a label "Sump inches deep". How many inches deep?
    d. Sheet LS-4 "General Planting Notes for Mitigation Areas" item 7. It is recommended that it be added that soil test results with recommended amendments will be supplied to the Town for review and approval prior to the start of the mitigation activities.

e. Sheet LS-4 "Site Specific Implementation Notes for Mitigation Areas South Road Site, Enfield, CT" item 6. Recommend adding limitation for the percentage of area that subsoil shall be left exposed.
f. A line runs through a species listed on Table 2. Is this line intentional?

5) Sheet GR-1.
   a. A construction exit is shown at the sites access from Barrett Road. If this access is not to be used for construction access, why is a construction exit shown?
   b. The existing treeline along the Barrett Road paper street is unclear. The treeline how it is shown indicates that the entire field area is wooded.
   c. "Haybale Erosion Control (HBEC)" detail shows that catch basins are to be protected with haybales and "marafi" filter fabric. It is recommended that the "marafi" fabric be changed to a silt sack or equivalent. "Marafi"fabric can easily rip with weight and can clog causing water to back-up and is not recommended for this application. Also, if the sacks are used in the roadway where traffic may run over haybales, haybales are usually not required to control sediment.
6) Sheet NT-1.
   a. It is recommended that the construction sequence specify that stumps may not be removed from a phase before a substantial portion of the previous phase is permanently stabilized. Trees may be cleared, leaving the stumps in place will reduce the potential for erosion on the portions of the site that are not active.
7) Sheet 1.
   a. The wetland line type appears to be incorrect in a few locations. The "points" of the line appear to be facing the wrong direction in a few locations.
8) Sheet LS-4 discusses that monitoring of the mitigation areas will be conducted for three growing seasons following construction of these areas with reports to be supplied to the IWWA following each monitoring. It is recommended that the applicant provide the criteria for review by the IWWA that will be used to determine whether the areas have been successfully constructed. The yearly report should evaluate these criteria.
9) It is recommended that the following be conditions of approval:
   a. A performance surety bond in the appropriate form shall be posted for 125% of the cost estimated by the applicant and confirmed by the IWWA Agent for the wetland mitigation activities (creation, enhancement, replacement) as proposed in the approved plans. The bond may be released by the IWWA Agent after the report is received following the third complete growing season for each mitigation area, as approved and completed to the Agent's satisfaction. The bond may be held for a longer period of time until it is determined that the mitigation areas are not performing as designed. Release of the bond by any other agency, board or commission does not remove the permittee's obligations with regard to this permit condition.
   b. In accordance with Section 18.2 of the Inland Wetlands and Watercourses Regulations most recently revised in February 2005 an independent inspector at a reasonable cost shall be hired by the Town and paid for by the applicant to conduct bi-weekly inspections for the Town of all erosion and sediment control measures and report their findings to the IWWA on a weekly basis. Inspections shall be conducted bi-weekly during active construction and every three weeks when construction is inactive and soils remain exposed. Inspections shall be completed after each rain event of greater than 0.5" as determined by NOAA nearest rainfall gauge. The content and presentation of the weekly reports shall be reviewed and approved by the IWWA Agent prior to the start of any construction activities. The independent inspector shall be contracted with prior to the start of work. Payment for approximate three months of inspection shall be

forwarded to the Town by the applicant for future payment of services prior to the start of construction. Funds shall be replenished prior to the balance dropping below the estimate for one inspection.

c. A wetland scientist, hired by the applicant, shall be on-site daily during the construction of the wetland mitigation areas. A weekly report that details progress, issues, solutions and determinations shall be submitted to the IWWA for tracking of the mitigation area construction progress. *(Not part of condition. This condition is recommended because the manner in which the mitigation areas are designed require guidance from a wetland scientist to be constructed. Detailed evaluations of the groundwater elevations and soil conditions in these areas have not been conducted to date. This makes field determinations by a wetland scientist essential to the long term success of these areas.)*

d. A Conservation Restriction as shown on the approved plans shall be placed on the applicable properties prior to the issuance of the Certificate of Occupancies for each subject property. A copy of the draft or final deed for each parcel must be submitted to the Inland Wetlands and Watercourse Agent for review and approval. Conservation restriction markers shall be installed in accordance with Town requirements, by a licensed surveyor, at the applicant's expense. Easement markers will be provided by the Planning Department. Where no trees are present greater than 6" dbh, easement markers shall be placed on 4" x 4" wooden posts to demarcate the easement boundary. Markers shall be placed at a minimum of 40 feet apart.

10) It is recommended that the conservation area be expanded to include the wetland mitigation areas.
11) Has the applicant considered directing roof runoff to rain gardens?
12) The soil stockpile that currently exists on the site should be shown on the plans. It should also be specified what will happen to the soil pile during construction.
13) The yard drain that is specified to be installed should be shown as it relates to the wetland boundary and identified in the field. It is a concern that the yard drain will drain the existing wetlands and should be closely evaluated.
14) If a fence may be installed between the development and neighboring properties, it should be shown on the submitted plans.
15) Long-term maintenance for the porous pavement and pavers should be included on the plans.
16) A written narrative of the alternatives investigated should be supplied that references the alternative plans submitted to date.
17) Water Quality Basin #1 is designed with a rip rap level spreader. Recommend considering "greening" this area by replacing the rip rap with the appropriate erosion control blanket or similar technology.
18) Recommend that the plans specify that no vehicles or fluid filled materials (including sani-cans, hydraulic equipment, etc.) be stored within 50 feet of wetlands or watercourses. If possible, it is preferred that these materials be stored 100 feet or more away.
19) Specify on the plans the location for any concrete washout from the project. Any concrete washout should be contained so that it does not seep into the soil. Concrete washout has a very basic pH and can be toxic to aquatic life and potentially groundwater supplies. Therefore, proper disposal of this material should be specified.

As always, please contact me with any questions or concerns.

Bednaz, Katie

From: Cabibbo, John
Sent: Thursday, February 25, 2010 11:05 AM
To: Bednaz, Katie; 'David Ziaks P.E.'
Cc: Bord, Jeffrey; Giner, Jose; ghesketh@fahesketh.com
Subject: RE: IW534 South Rd Adult Commercial Review

Engineering Division is in the process of reviewing the revised subject site plans, latest revision dated February 10, 2010, along with the Stormwater Management Report Supplement of the same date.

Item A. of the original report (attached below) has been addressed on the plans and in the revised stormwater report. Items B. through F. have not yet been addressed, although Katie you did mention that item D. was discussed at the last IWWA meeting.

G. With the newly proposed phased plan, a more detailed phased plan set should be submitted which will indicate how the drainage system will be installed through the proposed phase lines and how the erosion controls and grading will be installed as these phases could possibly stand alone for a significant time. Specific detail should be shown at the phase lines which cut through proposed improvements and at the roadway stubs.

Just a question. Would it be more practical to propose the residential section main entrance from the residential street and the commercial section entrance from South Road and install fire gates at locations between the different uses where drivers have an opportunity to turn around before they go too far?

From: Cabibbo, John
Sent: Wednesday, December 23, 2009 3:56 PM
To: Giner, Jose; Bednaz, Katie
Cc: Bord, Jeffrey; Higley, Virginia
Subject: Elderly Housing Commercial Development - Enfield Properties - South Road/Barrett Road - ART meeting comments/questions

Engineering Division is currently reviewing the subject site plans, dated December 11, 2009, along with the Stormwater Management Report, latest revision dated December 11, 2009.

The proposed drainage system has been designed to meet the minimum Town standard of the 25 year storm for the pipe capacities and the detention system has been designed for zero increase in runoff for the various storm events, as is tabulated on page 4 of the report along with the back-up.
A. In the review of the system design, a few discrepancies were found between the invert elevations shown in the stormwater report and those shown on the plans, more specifically catchbasins 10, 21 and 21A.
B. The Town regulations call for a 50 year storm capacity for culverts under roads of which there are two proposed on the subject project. One is an 18" diameter CPE near building #2 and the other is a 15" RCP near building #4. Inverts are noted on the plans indicating pipe slope but capacity calculations were not found for these two culverts.
C. In addition, the 18" culvert is paired with a 3" diameter pipe. Engineering Division typically requires minimum 8" diameter pipes for carrying storm drainage. When exposed to debris (leaves, branches, grass), these pipes are easily clogged due to the small diameter.
D. The narrative indicates that the existing culvert under the neighboring driveway, which is also the design outlet point, currently only has the capacity to carry between a 10 and 25 year storm event before topping the driveway. Though the proposed design analysis indicates a zero increase in peak runoff, as required, and design efforts are being proposed to enhance groundwater recharge and water quality, has the Applicant considered working with the neighbor in improving the capacity of this existing driveway culvert crossing?
E. There are Stormtech chambers proposed on the commercial portion of the subject parcel, intended for groundwater recharge, along with pervious block pavers in sections of the parking. Have any test holes been dug to determine the possible effectiveness of these improvements in the proposed locations, as it relates the soil types and groundwater elevations?
F. A site lighting plan should be added to the plan set along with lighting details. Elderly housing and commercial developments should be well lit for safety purposes.

When the review has been completed a report will be forwarded to Planning.

John Cabibbo, P.E.
Town of Enfield
Engineering Division
Assistant Town Engineer
(860) 253-6366

From: Bednaz, Katie
Sent: Thursday, February 25, 2010 10:23 AM
To: 'David Ziaks P.E.'
Cc: Cabibbo, John
Subject: IW534 South Rd Adult Commercial Review

<< File: Microsoft Word - IW534 South Rd Adult Commercial Review.pdf >>
Hi Dave,

Attached is my review memo for IW534, please distribute accordingly. John is working on his today and it should be to you shortly.

As always, please contact me with any questions or concerns.

Thank you,

Katie Bednaz
Certified PWS & Registered Soil Scientist
Assistant Planner / Wetlands Agent
Enfield Town Hall
820 Enfield Street
Enfield, CT 06082

Phone: (860) 253-6358
Fax: (860) 253-4729

Bednaz, Katie

From: Cabibbo, John
Sent: Wednesday, February 24, 2010 9:46 AM
To: Bednaz, Katie
Cc: Bord, Jeffrey
Subject: RE: IW 534 South Road

1. Erosion control blankets are typically used to protect slopes from erosion and help to establish ground cover after the construction activities have been completed. The Town has used erosion blankets on several projects including the steep slopes at the Play Road drainage project and the steep slopes at the Queen Street Drainage outlet. Based on the gentle slopes where blankets are proposed on the subject project, significant erosion is not anticipated. Exposed soil is more likely after snow removal in the locations proposed without curbing. Once ground cover has been established, any erosion near the pavement edge will most likely be caught in the vegetation.
2. Preliminarily, based on grading it appears that the stormwater control structures are phased correctly with proposed project phases. The Applicant's Engineer should address this question. It would be easier to determine if the phase lines are correct if the Applicant's Engineer submitted a larger scale drainage area map (DA-1).

Katie, you mentioned you have a call into the Applicant's Engineer requesting the larger scale DA-1. Please let me know when you receive the map so the Engineering review can be completed. Thanks.

From: Bednaz, Katie
Sent: Tuesday, February 23, 2010 10:58 AM
To: Cabibbo, John
Subject: IW 534 South Road

Hi John,

Natalie George called with the following questions regarding the proposed South Road development currently being reviewed by the IWWA. She called with these questions as she was unable to attend the last meeting because of the weather. These questions seem best directed to your department.

1. Erosion control blankets are proposed to be installed adjacent to pavement. She is concerned how the two will interface over time as it relates to shrinking and expanding of the pavement and the potential for the blanket to separate from the pavement. Leaving exposed soil that can potentially erode because the design is for sheet flow off of the pavement in these areas.

2. In regards to phasing. Is the stormwater control structures appropriately phased? She specifically mentioned the fact that the access is going to be constructed before the commercial building parking lots and was concerned about the drainage in this area.

Thanks,

Katie Bednaz
Certified PWS & Registered Soil Scientist
Assistant Planner / Wetlands Agent
Enfield Town Hall
820 Enfield Street
Enfield, CT 06082

Phone: (860) 253-6358
Fax: (860) 253-4729

IW 534

TOWN OF ENFIELD

February 16, 2010

Town of Enfield
Inland Wetland s Commission

Dear Chairman Maxellon:

Re: IW- 534- Enfield Properties- 153 South Rd

This is to inform you that the Town Council has authorized me to consent to the applicant's proceeding with the above referenced Inland Wetland Commission application. It is our understanding that this consent is required because the Town owns Barrett Rd. which has been included in the site plan, and in two area lies within the required upland review area. The Town Council also is reviewing the applicant's application for the abandonment of Barrett Rd, but has not yet acted on it. The Town has no objection to the Commission proceeding with its review and ruling on this application, but it must be without prejudice to the road abandonment issue. In the event that the road is not abandoned the applicant will have to revise its plan without the inclusion of Barrett Rd.

Sincerely,

Matthew Coppler
Town Manager

Town of Enfield
Town Manager's Office
820 Enfield Street
Enfield, Connecticut 06082

Telephone (860) 253-6350
Fax (860) 253-6310
www.enfield-ct.gov

Cabibbo, John

From: Cabibbo, John
Sent: Thursday, January 21, 2010 10:36 AM
To: Bednaz, Katie
Cc: 'Peruta, Brian'; 'Douglas Maxellon'; Bord, Jeffrey
Subject: RE: Wetlands Request South Rd

In regards to concerns about the direction of stormwater flow from the subject site, the Applicant's Engineer has submitted, in the back sleeve of the Stormwater Management Report, the "Proposed Conditions Watershed Area Plan" which clearly indicates the watershed break lines. These thick dashed lines are labeled "watershed limit" and follow the topographic land elevation peaks above the 130 elevation contours. Engineering Division reviewed this watershed plan submitted and compared it to our aerial topography maps, which are accurate to within 1 foot of elevation and also show how the stormwater drains north through the channels existing on the subject site. A color plot of the Town aerial topography maps showing the subject site and the surrounding area extended south past the Nitch property and the Tyler property, will be forwarded to you. The Town topography maps coincide with the watershed map the Applicant's Engineer submitted. Engineering also compared the Applicant's watershed limits with two other sources. The first source is the "Natural Drainage Basins in Connecticut" map which was produced in 1981 by the DEP, which a copy will be forwarded to you. You will note on the DEP map a building labeled as Asnuntuck Community College is actually the Superior Courthouse located on Phoenix Avenue. In 1981 that building was the location of Asnuntuck Community College. The second source is a watershed map produced by a Consultant hired by the Town in 1989 to study the Beeman's Brook Watershed, a copy will be forwarded to you. All sources conclude that the subject site is within the Freshwater Brook watershed which runs north from the subject site and the Nitch and Tyler properties are located in the Beeman's Brook Watershed which is located south of the proposed development. Therefore the development, as proposed, will not effect the stormwater flows of the Nitch or Tyler properties, as these are located in a different watershed based on existing land elevations.
In regards to the downstream effects within the Freshwater Brook watershed, the Applicant has proposed detention as is required in the Town regulations and has indicated reductions in peak runoff rates from the existing conditions. Therefore the Applicant has met the Town's requirement for zero increase in peak runoff rates from the subject site.
The question about the discharge pipe and a "wavering" answer at the meeting. If this is about the pipe under the driveway of the neighboring property to the west, the original review report e-mail dated December 23, 2009 addressed this issue in item "D" asking if the Applicant considered working with the neighbor to improve the flow capacity at that location. Maybe the wavering answer was from the Applicant?

From: Bednaz, Katie
Sent: Wednesday, January 20, 2010 10:16 AM
To: Bord, Jeffrey; Cabibbo, John
Cc: 'Peruta, Brian'; 'Douglas Maxellon'
Subject: FW: Wetlands Request South Rd

Hi Jeff and John,

The email below contains a request from the IWWA to you regarding your review of the South Road project which is currently pending. If you can respond to this question in writing as part of your review report, or at the next meeting, that would be great.

It sounds like the applicant is not planning to submit revised plans and additional reports until the first week of February. They have also requested that the application be continued until our February 16th meeting. They are hoping that that will give us enough time to conduct our review in time for the meeting packet.

They showed the fire entrance to be onto South Road, just to the west of Freshwater. It hasn't been formally submitted to the file at this point nor is there a response from the fire department on this matter. Just letting you know to keep you in the loop as it may help for your review.

Thanks,

Katie Bednaz
Certified PWS & Registered Soil Scientist
Assistant Planner / Wetlands Agent
Enfield Town Hall
820 Enfield Street
Enfield, CT 06082

Phone: (860) 253-6358
Fax: (860) 253-4729

From: Douglas Maxellon [mailto:doug@ecincorporated.com]
Sent: Wednesday, January 20, 2010 9:47 AM
To: Bednaz, Katie
Cc: 'Peruta, Brian'
Subject: FW: Wetlands Request South Rd

Katie,
See attached concerns from Brian regarding water flow from this property.

We must also confirm the consultant's analysis that the discharge from the property has a northern flow into the industrial park and into the Freshwater watershed as stated. I also want to be 100% sure we are not contributing to the southerly flow towards the properties Brian referenced below due to the fact we already have issues on these properties.

The discharge pipe size off the property seemed to be a wavering answer last night. This also needs to be confirmed the discharge pipe is correct.

I would like to get a full size set of drawings representing this flow calculation that was stated last night.

Thank You!!!
Douglas C. Maxellon
IWWA Chairman
Town of Enfield
Home: 860-745-1737
Work: 860-549-2822
Cell: 860-982-7505

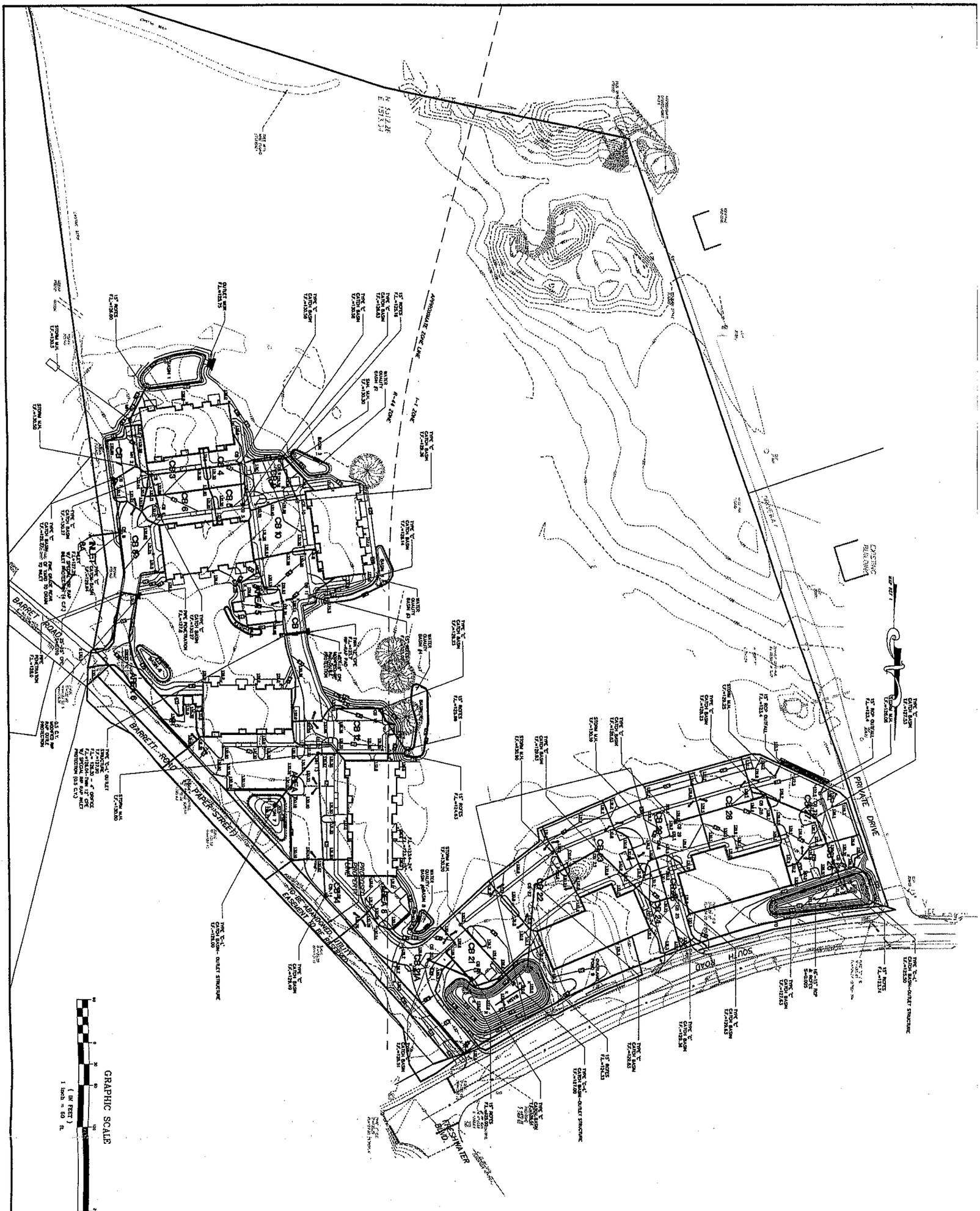
From: Peruta, Brian [mailto:bperuta@MassMutual.com]
Sent: Wednesday, January 20, 2010 9:12 AM
To: doug@ecincorporated.com
Cc: Katie Bednaz Work
Subject: Wetlands Request

For the South Road application I'd like to get a better understanding of the water flow as it leaves the property and the downstream impacts. This stems from worries that any water flowing in a southerly direction will potentially

impact properties already having concerns about water. Specifically Mr.. Nitch's property on Post and the Tyler property Post Office come to mind. How do I request an engineering analysis with some maps that confirm the flows as they were represented last night?

Brian

Brian Peruta
Enterprise Architecture Services, ETO
MassMutual Financial Group
413.744.3458
1295 State Street; E210; Springfield, MA 01111
MassMutual. We'll Help You Get There.®



DA-1

DRAINAGE AREA MAP
PREPARED FOR
TROIANO & SONS
SOUTH ROAD
ENFIELD, CONNECTICUT

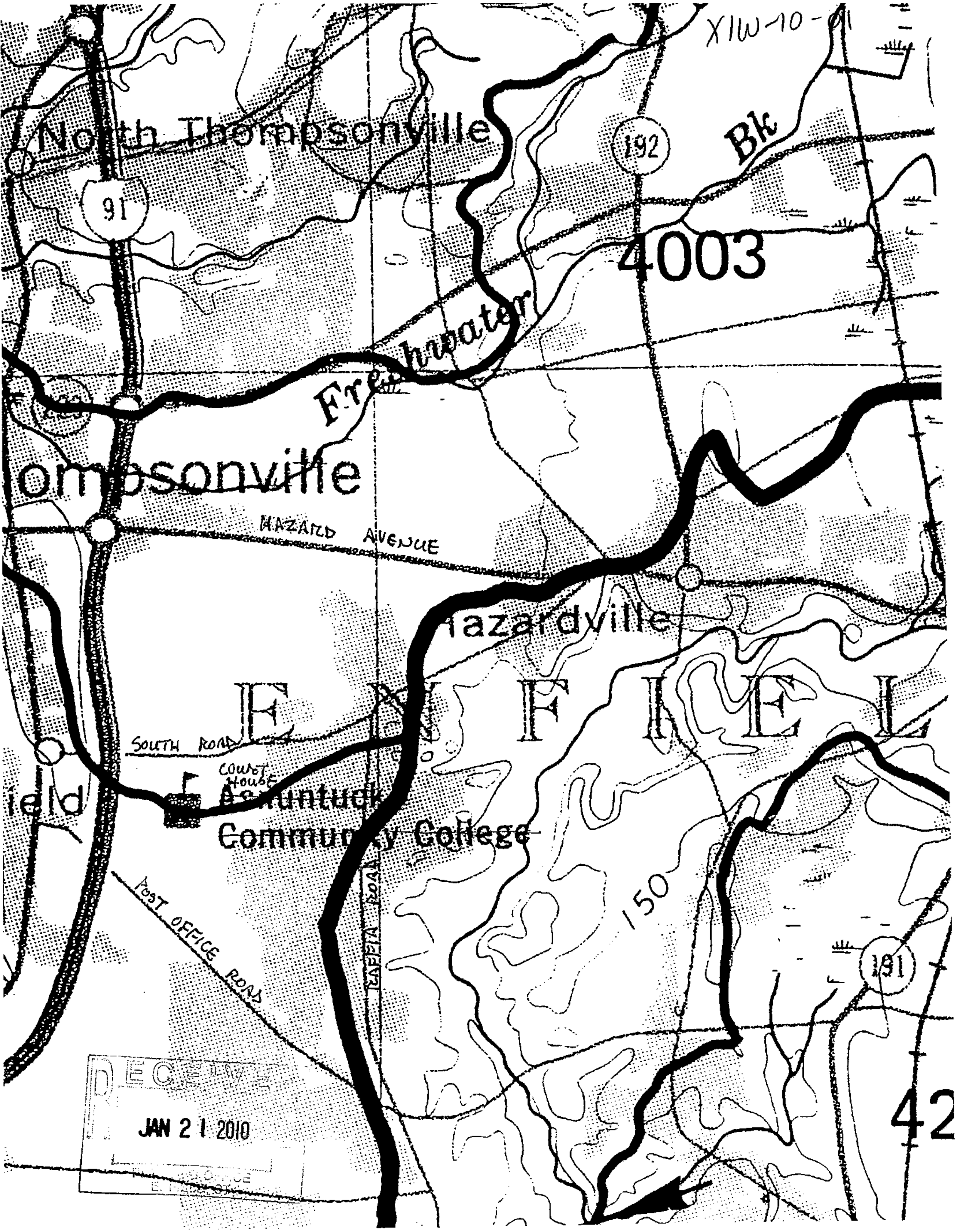
Date: 09-30-09	Drawn by: CAD	Job no: 90071
Scale: 1" = 60'	Checked by: CAH	Sheet no: 1 OF 1

Revisions:

No.	Date	Description
1.	02-10-2010	Staff Comments

F. A. Hesketh & Associates, Inc.
6 Creamery Brook, East Granby, CT 06026 · Phone (860) 653-8000 · Fax (860) 844-8800
146 N W Broad Street, Southern Pines, NC 28387 · Phone (910) 692-2844 Fax (910) 692-3356
Civil & Traffic Engineers · Surveyors · Planners · Landscape Architects
www.fahesketh.com · mail@fahesketh.com

G:\1990\90071\Submittal\2010-02-10 Inland Wetlands\DrainAreas4.dwg, DA-1, Feb. 09, 2010 - 3:37:43 PM



XIW-10-01
North Thompsonville
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azardville
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SOUTH ROAD
COURT HOUSE
Community College
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POST OFFICE ROAD
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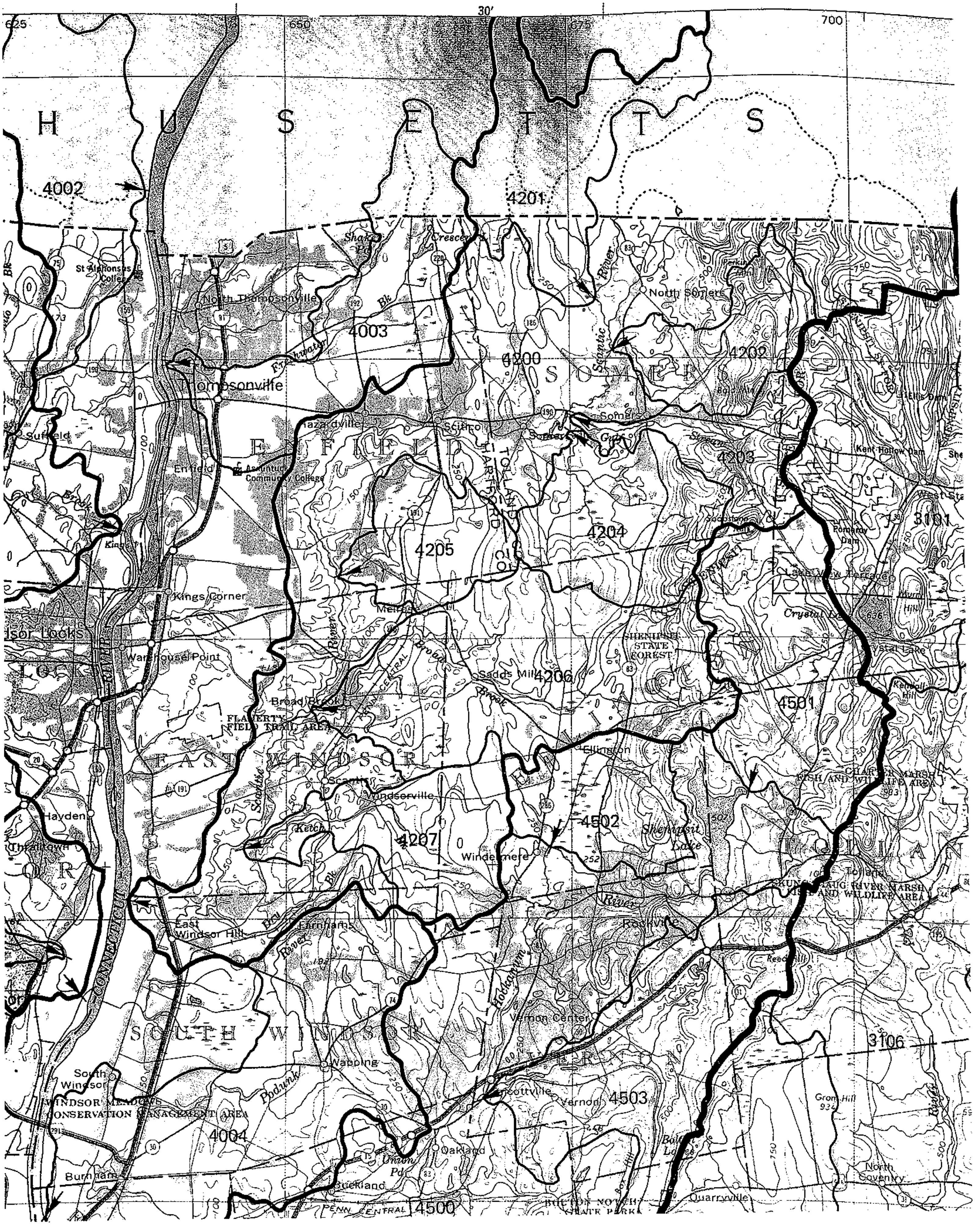

H U S E T T S
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St Alphonsus College
Suffield
Kings Corner
Warehouse Point
Broad Brook
Melrose
Sadds Mill
Ellington
Scantic
Windsorville
Windermere
Hayden
East Windsor Hill
Farnhams
Rockville
Vernon Center
Wapping
South Windsor
Talcottville
Vernon
Oakland
Buckland
Burnham
Quarryville
Tolland
Reed Hill
North Coventry
Grant Hill
Kent Hollow Dam
Pomeroy Dam
Lake View Terrace
Crystal Lake
Shenipsit Lake
E N F I E L D
S O M E R S
E A S T W I N D S O R
S O U T H W I N D S O R
T O L L A N D
SHENIPSIT STATE FOREST
FLAHERTY FIELD TRIAL AREA
CHARTER MARSH FISH AND WILDLIFE AREA
SKUNGAMAUG RIVER MARSH FISH AND WILDLIFE AREA
WINDSOR MEADOWS CONSERVATION MANAGEMENT AREA
BOLTON NOTCH STATE PARK
PENN CENTRAL
CONNECTICUT RIVER
Hockanum River
Podunk
Scantic River
Freshwater
Broad Brook
Union Pd
Shaker Pd

XII-10-01

TOWN OF ENFIELD, CONNECTICUT
DEPARTMENT OF PUBLIC WORKS

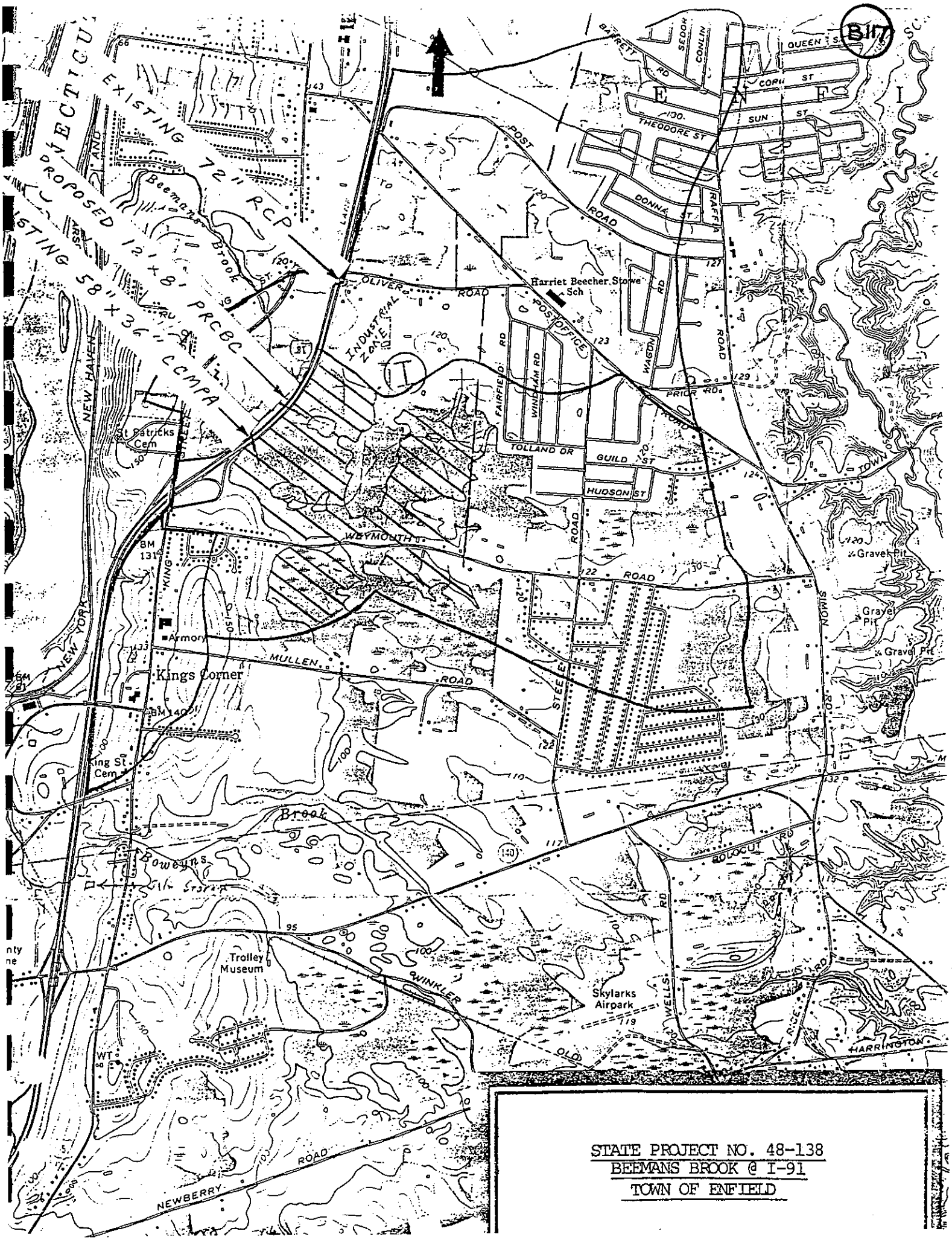
BEEMANS BROOK FLOOD STUDY
FINAL REPORT

Appendix B

PREPARED BY

MAGUIRE GROUP INC.
ENGINEERS AND PLANNERS
NEW BRITAIN, CONNECTICUT

JANUARY 19, 1990



STATE PROJECT NO. 48-138
BEEMANS BROOK @ I-91
TOWN OF ENFIELD

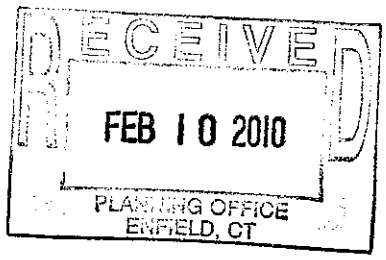
Stormwater Management Report Supplement

Proposed Elderly Housing and Commercial Development South Road, Enfield

Prepared for:

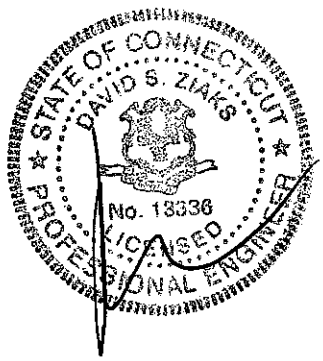
Enfield Properties
Enfield, CT

FAHA Project: 90071.00



Prepared By:

F. A. Hesketh & Associates, Inc
East Granby, CT



February 10, 2010

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Stormwater Management Report (Supplement)
Proposed Elderly Housing and Commercial Development
South Road, Enfield, CT

1. Narrative

In addressing town staff concerns, a number of minor design changes have been incorporated into the proposed development plans. The changes include the addition of a paved emergency access road from South Road, and the reduction of disturbances within upland review areas adjacent to wetland resources. These changes have resulted in some minor modifications to the layout of storm drain systems and revisions to proposed grading in the upland review areas and in water quality basins.

This supplemental report presents updated analysis for the design of the individual stromwater drainage systems (i.e. pipe to pipe analysis), overall proposed conditions hydrologic analysis, and analysis of revised water quality basins for compliance with hydrologic sizing criteria for stormwater practices as set forth in the 2004 Connecticut Stormwater Quality Manual.

This report is provided to supplement the Stormwater Management Report originally submitted as part of the application and presents only the revised proposed condition analysis.

2. Revised Pipe to Pipe Analysis

Minor modifications were made to the storm drain systems to facilitate minor changes to the geometry of parking areas, and to pick up runoff from the emergency access road from South Road. The configuration of the proposed storm drain systems as depicted on Sheets GR-1, GR-2, UT-1, and UT-2 (revised 02-10-2010). For each of the proposed storm drainage systems, a detailed, pipe to pipe analysis was re-conducted using the Hydraflow Storm Sewers 2008 for Windows software. This software uses the Rational Method and Manning's Formula to compute peak flow to each basin, and to calculate the capacity of individual culverts.

Input data includes the geometry and configuration of the storm drain systems, catchment area of each inlet, runoff coefficients, and times to inlet. Catchment areas were calculated based on proposed topography utilizing polyline delineations in AutoCAD. The catchment areas are depicted graphically on Sheet DA-1, Drainage Area Map (revised 02-10-2010) for each of the drainage areas analyzed. Weighted runoff coefficients were calculated based on percentages of impervious and pervious areas within each catchment area, as determined by areas of pavement, rooftops, and landscaped areas. A coefficient of 0.9 was used for all rooftops and impervious areas. A coefficient of 0.15 was used for landscaped areas.

Rainfall intensity data was taken from the CT DOT Drainage Manual. A copy of the Rainfall Intensity Curve is presented in Appendix 1. Because of the developed nature and relatively small catchment areas for each catch basin, the time to inlet is assumed to be five minutes for all inlets.

For pipe to pipe analysis of culverts connecting catch basins inlets, storm sewer culverts were designed to convey runoff from the 25-year storm event. Results of analysis are attached, and include summaries of system design based on CT DOT output formats. Program input and output data reports are presented in Appendix 1. The analysis indicates that all storm drain culverts are designed to adequately convey the 25-year storm event.

3. Revised Hydrologic Analysis
Revised Proposed Conditions (02-10-2010)

The post-development condition hydrologic analysis was re-run using the developed conditions depicted on the plans revised to 02-10-2010. As with the original hydrologic analysis, the up-dated analysis was conducted using Hydraflow Hydrographs 2007 software (based on TR-55) to determine peak flows for the revised post-redeveloped conditions. Analysis was performed for the 2-, 5-, 10-, 25-, 50- and 100-year return period storm events, using the 24-hour duration storm event for the Hartford County area. Input data includes watershed area, weighted curve number (CN) and times of concentration for the watersheds, and stage-storage and stage-discharge relationships for each detention basin.

Watershed areas were determined by delineation using available topographic mapping of the watershed. Weighted curve numbers were calculated by computing subareas for each soils type and land use for the individual catchment areas. Soil types were taken from available SCS mapping. Results of analysis of the hydrologic model for the existing, originally proposed, and revised (02-10-2010) post-conditions are presented below:

TABLE 1

Results of Analysis – Hydrologic Modeling
Peak Rates of Runoff at Driveway Culvert

Return Period Event	Existing Conditions Peak Rate of Discharge (cfs)	Proposed Conditions (12-11-10) Peak Rate of Discharge (cfs)	Proposed Conditions (rev. 02-10-10) Peak Rate of Discharge (cfs)
2- Yr	9.5	9.4	9.5
5-Yr	14.5	14.4	14.4
10-Yr	16.2	16.0	15.9
25-Yr	31	28	28
50-Yr	49	47	47
100-Yr	63	61	61

The data indicate that there is a slight net decrease in peak rate of discharge at the driveway culvert from the pre- to post-developed condition for all return period events and that there is no increase in peak rate of discharge to downstream properties.

Detailed results of analysis, input and output reports, and input data for the hydrologic analysis for the proposed conditions (Revised 02-10-2010) are included in Appendix 2. See the original Stormwater Management Report for existing conditions and original proposed condition analysis.

4. Hydrologic Sizing Criteria for Stormwater Treatment Practices

The design changes presented on the revised plans (revised to 02-10-2010) reflect the redesign of some of the proposed water quality basins. Grading changes or design changes in the configuration of the storm drain systems have resulted in modifications of the contributory watershed for some of the water quality basins. Because of these changes, each water quality basin was re-evaluated to ensure the minimum recommended water quality volume was being treated fro each contributory area.

As in the original report, this section presents information to demonstrate the proposed stormwater treatment practices presented in the revised plans (revised 02-10-2010) follow the recommendations of the 2004 Connecticut Stormwater Quality Manual (SWQM) as presented in Chapter 7, Hydrologic Sizing Criteria for Stormwater Treatment Practices for pollutant reduction.

Water Quality Volume (WQV)

The pollutant reduction objectives for the proposed project will be met through treatment of more than the minimum required water quality volume (WQV). This will be achieved through the use of ten Stormwater Management Basins that will receive stormwater runoff for the vast majority of the developed portions of the site. The basins are designed to capture and treat, by primary stormwater treatment practices, well in excess of the minimum WQV. By capturing and treating the minimum water quality volume, the 80% TSS removal goal will be met. Summaries of calculations demonstrating achievement of the WQV recommendations are shown below.

Water Quality Volume (WQV) calculations were made for each of the proposed stormwater management basins, using the formula presented in Section 7.4.1 of the SWQM.

WATER QUALITY VOLUME (WQV)

WQV (AC-FT) = 1(R)(A)/12

R = (RUNOFF COEF)=.05+.009(I)

I = PERCENT IMPREVIOUS COVERAGE

A = AREA(AC)

A summary of the calculated Water Quality Volumes for each of the ten basins is presented in Table 2.

TABLE 2

Summary of Minimum Recommended WQV
Per Section 7.4.1 of SWQM
By
Stormwater Management Basin

STORMWATER QUALITY BASIN NUMBER	CONTRIBUTING WATERSHED AREA TO STORMWATER QUALITY BASIN, A (Ac)	IMPERVIOUS AREA (Ac)	PERCENT IMPREVIOUS COVERAGE, I (Ac)	RUNOFF COEFFICIENT, R	WQV (Ac-Ft)	WQV (CF)	DISCHARGE
1	0.72	0.56	78%	0.750	0.045	1,960	Wetland
2	0.26	0.20	77%	0.742	0.016	700	Wetland
3	0.26	0.22	85%	0.811	0.018	770	Wetland
4	0.43	0.26	61%	0.595	0.021	930	Wetland
5	0.076	0.046	61%	0.595	0.0038	160	Wetland
6	0.40	0.16	40%	0.408	0.013	580	Wetland
7	0.85	0.39	47%	0.466	0.033	1,400	Wetland
8	0.09	0.05	50%	0.500	0.004	160	Wetland
9	1.89	1.40	74%	0.717	0.113	4,900	Wetland and Infiltration
10	0.96	0.80	83%	0.797	0.064	2,800	Wetland and Infiltration

Table 3 presents a summary comparison between the minimum recommended WQV and the WQV provided for each of the stormwater management basins. In all cases the proposed basin exceeds 100% of the minimum recommended WQV.

TABLE 3

Comparative Summary of Provided Water Quality Volumes in Sediment Forebays and Total WQV in Stormwater Management Basins to Minimum Recommended WQV per Section 7.4.1 of the SWQM

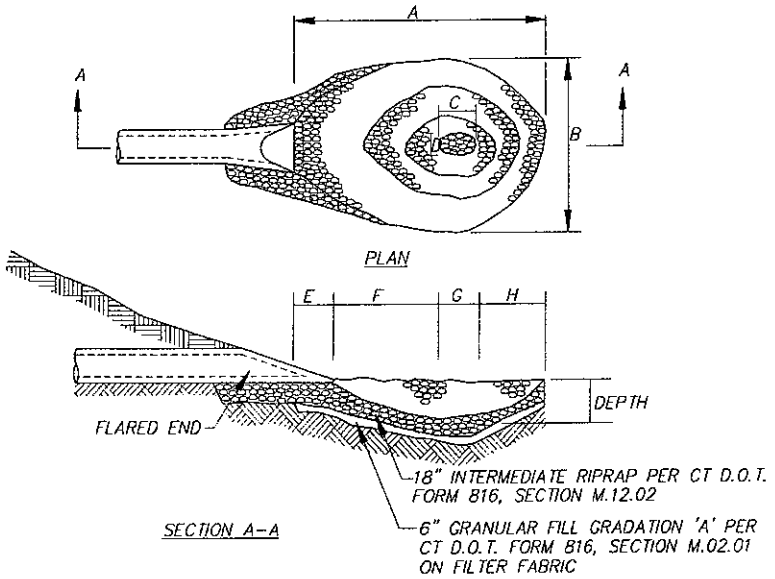
STORMWATER QUALITY BASIN NUMBER	BOTTOM ELEVATION (FEET)	WATER ELEVATION (FEET)	WATER DEPTH (FEET)	MINIMUM REQUIRED WQV (CF)	TOTAL VOLUMETRIC CAPACITY OF BASIN BELOW OUTLET ELEVATION (CF)	PERCENT OF MINIMUM WQV PROVIDED IN STORMWATER QUALITY BASIN (CF)	100 YEAR WATER LEVEL
1	124.00	125.75	1.75	1,960	4,830	246%	126.84
2	124.00	125.00	1.00	700	823	117%	N.A.
3	124.00	124.80	0.80	770	1,650	214%	N.A.
4	124.00	124.60	0.60	930	1,096	117%	N.A.
5	127.00	127.60	0.60	160	194	121%	N.A.
6	127.00	128.00	1.00	580	844	145%	N.A.
7	126.75	129.00	2.25	1,400	2,680	191%	129.30
8	126.00	127.00	1.00	160	415	259%	N.A.
9	122.00	123.95	1.95	4,900	5,660	115%	127.25
10	121.00	123.40	2.40	2,800	6,300	225%	125.77

The data indicate that the pollutant reduction goals of the SWQM are met site wide, by use of the proposed stormwater management basins, which have been demonstrated to

capture and treat in excess of the CT DEP's minimum recommended water quality volume.

Complete Water Quality Volume and Water Quality Basin calculations are attached in Appendix 3.

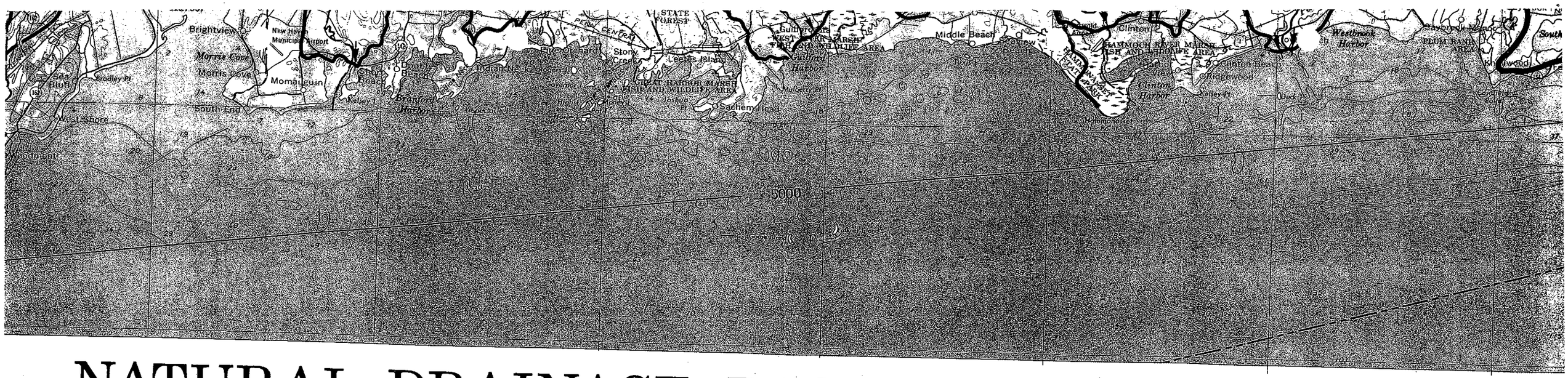
The storm drain systems that convey runoff to each of the stormwater quality basins were designed to town standards for the 25-year, 24-hour storm event, following Connecticut DOT methodologies. Each of the storm drain systems that discharge into the stormwater management basins will discharge through a flared-end section into a rip rap plunge pool located at the outlet of the culvert. The plunge pools are designed by CT DOT criteria (which meets the energy dissipation criteria per Section 5-10 of the Connecticut DEP's 2002 Connecticut Guidelines for Soil Erosion and Sediment Control). The design of the plunge pool is a function of the outlet pipe diameter. A detail of the plunge pool is shown below.



PIPE SIZE	A	B	C	D	E	F	G	H	WT. RIPRAP TONS.	DEPTH
15"	10'	7'	1 1/2'	1'	1'	4 1/2'	1 1/2'	3'	6	1'-0"
18"	12'	8'	2'	1'	1'	5'	2'	4'	8	1'-4"
24"	17'	10'	2 1/2'	1 1/2'	1'	8'	2 1/2'	5 1/2'	15	1'-10"
30"	20'	13'	3'	2'	2'	9'	3'	6'	22	2'-0"
36"	24'	16'	3 1/2'	2'	2'	9 1/2'	3 1/2'	7	33	2'-4"

RIPRAP PLUNGE POOL (RRPP)

N.T.S.



NATURAL DRAINAGE BASINS IN CONNECTICUT

STATE OF CONNECTICUT
NATURAL RESOURCES CENTER, DEPARTMENT OF ENVIRONMENTAL PROTECTION
in cooperation with the UNITED STATES GEOLOGICAL SURVEY

Funded in part through grants from the U.S. Water Resources Council

1981

Compiled by Marianne McElroy

Connecticut Geological and Natural History Survey

Hugo F. Thomas, State Geologist

Scale 1:125,000
1 inch equals approximately 2 miles

5 0 5 10 MILES
5 0 5 10 15 KILOMETRES

Contour interval 50 feet
NATIONAL GEODETIC VERTICAL DATUM OF 1929

BASE MAP SOURCE DATA

Compiled, edited, and published by the Geological Survey in cooperation with State of Connecticut agencies
1927 North American datum. Polyconic projection
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER

COMPILED IN 1965

25,000-foot grid based on Connecticut coordinate system

IW 535 - T.P. Rentals, LLC

CORRESPONDENCE

Bednaz, Katie

IW528
(correspondence)

From: Chuck Brady [ChuckBrady@abcontainer.com]
Sent: Wednesday, February 24, 2010 1:43 PM
To: Bednaz, Katie

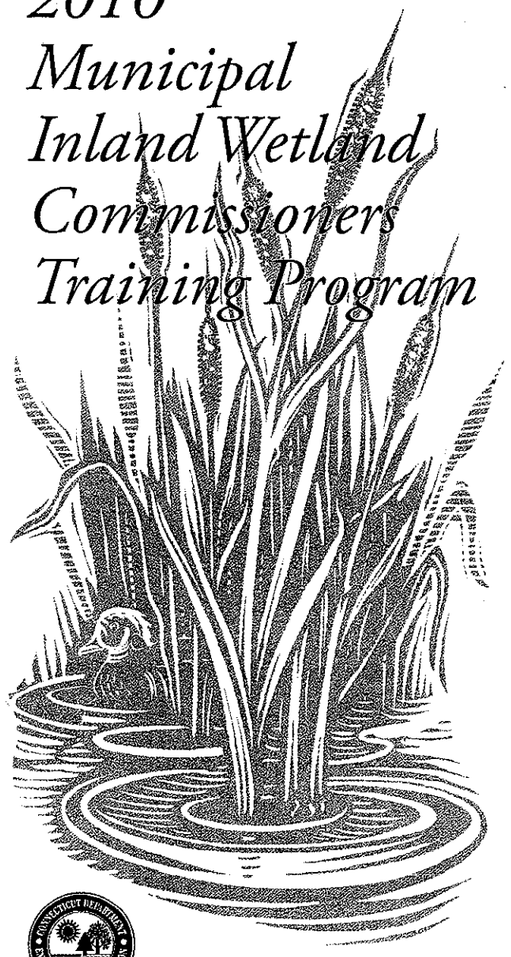
Katie, great seeing you a few days ago. The debris from our addition will be taken to: American Material, Bloomfield, Ct.
If you need anything more, let me know.
Regards, Chuck Brady

University of Connecticut
Center for Continuing Studies

Visit us online at
continuingstudies.uconn.edu

Correspondence

2010 Municipal Inland Wetland Commissioners Training Program



State of Connecticut
Department of Environmental Protection
79 Elm Street, Hartford CT 06106-5127
Amey Marrella, Commissioner
www.ct.gov/dep

The 2010 Training Program

The Municipal Inland Wetland Commissioners Training Program is presented by the Connecticut Department of Environmental Protection (DEP) Wetlands Management Section. Pursuant to the General Statutes of Connecticut Section 22a-39, the DEP is charged with developing an annual comprehensive training program for inland wetlands agency members and staff. The annual program covers a broad range of legal, administrative and scientific subjects relevant to municipal inland wetlands regulation.

Who should attend?

The Municipal Inland Wetland Commissioners Training Program is intended for Connecticut's 170 municipal inland wetlands agencies. The training program is organized into three segments in order to meet the varying needs and diverse backgrounds of agency members and staff. The three segments are designed as follows:

- ▲ Segment 1 is tailored for **new** agency members and staff.
- ▲ Segment 2 is recommended for all agency members and staff.
- ▲ Segment 3 is designed for agency staff (wetland agents) and experienced agency members.

Is pre-registration required?

Due to limited enrollment, participants must pre-register. Registration is on a first-come, first-served basis with priority being given to inland wetlands agency members and staff. Registrants will receive confirmation and directions online or in the mail.

What happens if a program segment is cancelled or rescheduled?

The DEP reserves the right to cancel or reschedule the training program. Registrants will be notified at the earliest possible time and offered a different date/location. If the participant is unable to switch to a different date/location any paid registration fees will be refunded in full.

Can a refund be made if a participant needs to cancel?

Registration fees are refundable only if cancellation is received 48 hours prior to the start of the program. If cancellation is received with less than 48 hours notice the participant will be charged the full program fee. **This applies to voucher registrants as well.** Please call the UConn student services office at 877-892-6264 or 860-486-4905.

Are program registration fees waived for any reason?

CT General Statute Section 22a-42(d) provides that the DEP waive program registration fees for one person from each town. A voucher for Segments 1 and 2 of the 2010 Municipal Inland Wetland Commissioners Training Program has been sent to each town's inland wetlands agency with instructions on its use. To receive complimentary registration, the designated representative must include the *original DEP voucher* with the mailed registration form or use the voucher code with online registration. ***Participants that register for a Segment using the voucher and fail to attend, or fail to cancel at least 48 hours prior to the start of the program, will be charged the full program fee.***

Which segment meets the agent training requirement pursuant to CT General Statute Section 22a-42a(c)(2)?

The Statute requires duly authorized wetland agents to complete the DEP's comprehensive training program before the above authority can be delegated to them by their inland wetlands agency. Agents who have completed all segments of a DEP Municipal Inland Wetland Commissioners Training Program offered annually since 1995 meet this requirement. Other agents must complete all segments of the 2010 or a future annual training program to meet this requirement.

Workshop Descriptions

March/April 2010 - Segment 1

Connecticut's Inland Wetlands and Watercourses Act: *A Primer for New Inland Wetlands Agency Members and Staff*

Segment 1 is designed for new agency members and staff. Participants will learn the fundamentals of the Connecticut Inland Wetlands and Watercourses Act. The segment will also include a presentation on wetland soils, a lesson on site plan review and map reading, and a brief summary of the functions and values of wetlands and watercourses, with a focus on fisheries habitat and stream crossings.

May/June 2010 - Segment 2

Connecticut's Inland Wetlands and Watercourses Act: *A Legal, Administrative, and Resource Management Update*

Segment 2 is recommended for all agency members and staff. The workshop will begin with DEP representatives providing a synopsis of the 2010 legislative session, including any amendments to the Inland Wetlands and Watercourses Act. The program will continue with representatives from the Office of the Attorney General presenting an examination of recent court cases. A number of issues associated with these cases will be discussed including, but not limited to, the conditioning of permits, the factors for consideration when regulating activities outside of wetlands and watercourses, and enforcement of permitted operations and uses as related to agriculture. The Office of the Attorney General will conclude the first half of the workshop with an open question and answer session.

The second half of Segment 2 will focus on two wetland related topics – the application of pesticides and endangered species. The DEP Pesticides Management Program will provide a discussion of Connecticut pesticides law, the DEP pesticide permitting process, and the role of municipal inland wetlands commissions in such process. The DEP Wildlife Division will provide an overview of laws governing endangered species in Connecticut, a look at wetland related endangered species, and a discussion of the Connecticut Natural Diversity Database. Segment 2 will conclude with updates from the DEP Wetlands Management Section.

October 2010 - Segment 3

Program information available in September

Segment 3 is designed for municipal inland wetlands staff and experienced agency members. The first part of the workshop will be conducted in the classroom and will consist of presentations and discussions on the chosen subject. The second part of the workshop will take place in the field. Brochure and online registration for this segment will be available in September.

IMPORTANT CHANGES:

1. Voucher registrants that fail to attend a Segment or fail to cancel at least 48 hours prior to the program will be charged the full program fee of $60.00 per segment.

2. Please provide all requested information on the registration form. Incomplete registrations will be delayed and the program may be filled to capacity before processing can be completed.

Registration Form Wetlands *Segments 1 & 2* Spring/Summer 2010

Please copy this registration form for additional registrants.

Online registration:
Have credit card information ready.
Visa, MasterCard, Discover, Diners International.
http//continuingstudies.uconn.edu/professional/dep/wetlands.html

Mail:
Enclose completed form & DEP voucher, check or P.O. :
University of Connecticut, Student Services Office,
One Bishop Circle, Unit 4056, Storrs, CT 06269-4056

Name_____
(Name as it will appear on your certificate, if applicable.)

Phone: Day (___)_____

Evening (___)_____

Preferred Mailing Address: ❑ Home ❑ Business

Street_____

City_____State_____Zip_____

Email_____

Please list any special needs you may have.

_____

The following required information must be provided for this registration form to be processed.

Check one of the following:

❑ I am a member of my municipal Inland Wetlands Agency for the Town/City of:
_____

❑ I am a municipal employee hired/assigned to support the Inland Wetlands Agency for the Town/City of: _____

My title is: _____

❑ Other, please briefly explain (i.e.: Conservation commission member, concerned citizen, consultant, etc.)

_____

Certificate Group # 3309

Segment 1, Term 1103

❑ Thursday, March 25th, Torrington, Hogan Lecture Hall, UConn Campus (S101) 9AM – 4PM

❑ Saturday, March 27th, Killingly, Northeastern Connecticut Council of Governments (S102) 9AM – 4PM

❑ Thursday, April 1st, Old Lyme, DEP Marine District Headquarters (S103) 9AM – 4PM

❑ Saturday, April 10th, Derby, DEP Kellogg Environmental Center (S104) 9AM – 4PM

Segment 2, Term 1105

❑ Wednesday, May 19th, Killingly, Northeastern Connecticut Council of Governments, 9:00 AM – 4:00 PM (S201)

❑ Saturday, May 22nd, Torrington, Hogan Lecture Hall, UConn Campus, 9:00 AM – 4:00 PM (S202)

❑ Tuesday, May 25th, *and* Thursday, May 27th, Hartford UConn Graduate Business Learning Center 6:30 PM – 9:30 PM (S203)

❑ Wednesday, June 2nd, New Canaan, Lapham Community Center, 9:00 AM – 4:00 PM (S204)

❑ Saturday, June 5th, Old Lyme, DEP Marine District Headquarters, 9:00 AM – 4:00 PM (S205)

Fee: $60 per course section
(includes handouts and refreshments)

❑ DEP voucher #_____enclosed.

❑ Check enclosed made payable to UConn.

❑ PO#_____

Directions to segment locations are available online (http://continuingstudies.uconn.edu/professional/dep/wetlands.html).

Correspondence

TOWN OF ENFIELD
DEVELOPMENT SERVICES

Planning • Zoning • Building • Economic and Community Development

Robert J. Lawton
123 Weymouth Road
Enfield, CT 06082

February 18, 2010

Re: Tree Removal at 123 Weymouth Road

Dear Mr. Lawton,

It was brought to my attention at the February 16, 2010 Inland Wetlands and Watercourses Agency (IWWA) meeting that a neighbor had observed that you were cutting trees close to or within the wetland resource area. On February 18, 2010 it was observed that a few trees had been cut in what appears to be a wetland according to our Town of Enfield Official Wetlands Map. A copy of this map is attached for your reference. It can also be accessed by going to our website at http://www.enfield-ct.gov/ and going to Enfield GIS. Below is a photograph of the activity of concern.

The Inland Wetlands and Watercourses Regulations (IWWR) regulate activities within and 100 feet from wetlands. The regulations do allow homeowners to maintain their property with the provision that activities shall not include removal or deposition of significant amounts of material from or into a wetland or watercourse.

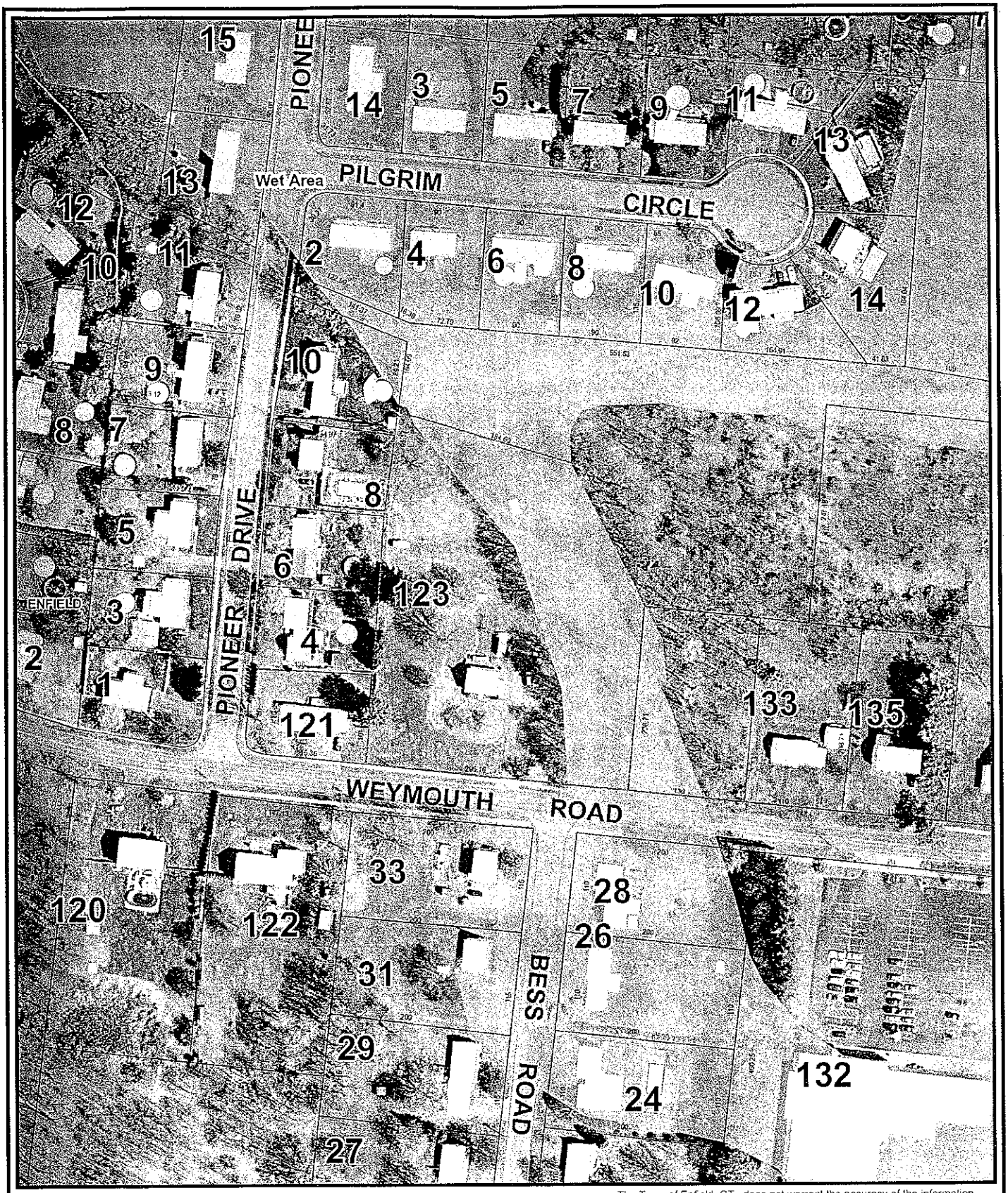
February 18, 2010

It appears that the level of activity conducted at 123 Weymouth Road is allowed by the IWWR as of right and does not require a permit. If additional activities in the resource area are intended (more clearing, shed, structure, etc) a permit may be required. If you are unsure if any future activities would require a permit, please contact me with any questions or concerns.

I thank you for your cooperation in advance.

Sincerely,

Katie Bednaz
Inland Wetlands Agent
860-253-6358



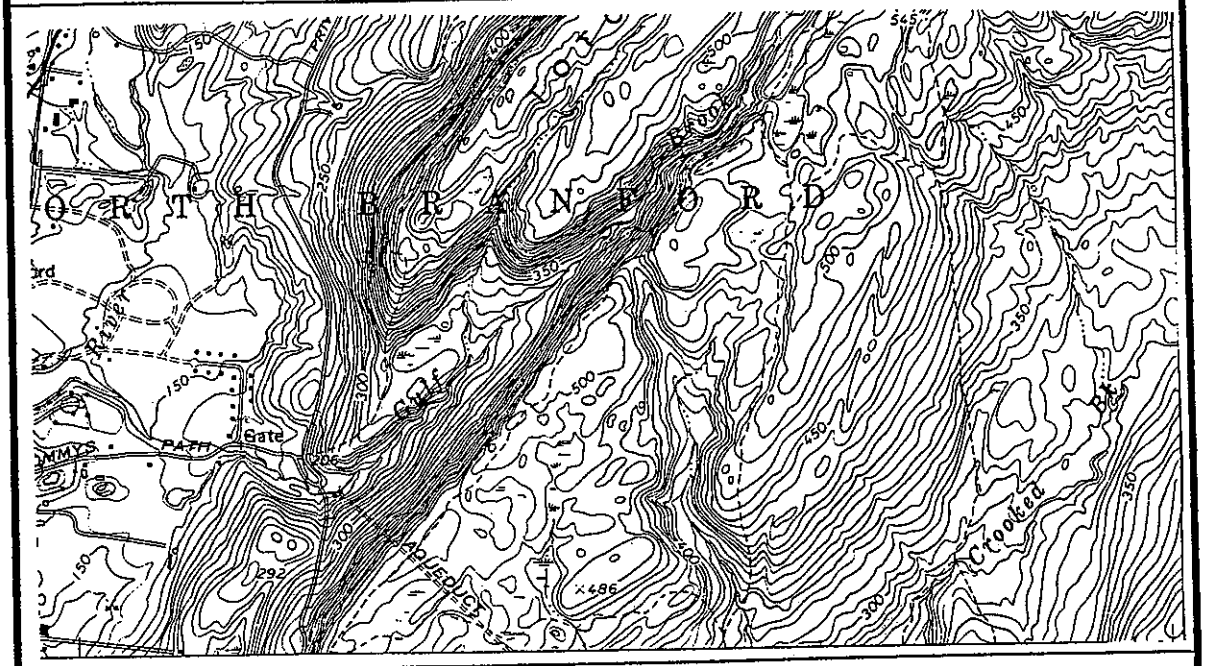
123 Weymouth Road

Wetland Boundary

Map Date: 2/18/2010

Correspondence

Map-Reading and Watershed Delineation Skills for Inland Wetland Commissioners



Connecticut Department of Environmental Protection
Bureau of Water Management
Inland Water Resources
Inland Wetland Program

Prepared & Illustrated by Valerie Keib, Student Intern
Candidate for M.S. Environmental Studies, Resource Management and Administration
Antioch New England Graduate School, Keene, NH

October, 1994

Table of Contents

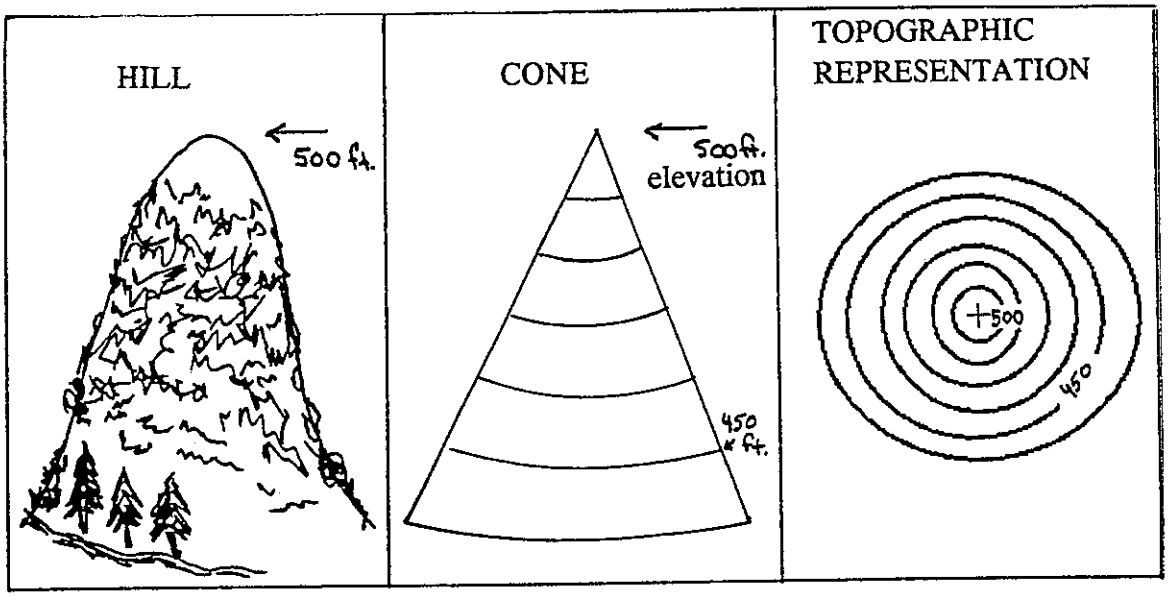
Chapter 1 -- Topographic Maps

Contour Lines

If you are a standing on a chair looking straight down at a basketball on the ground, how would you draw the ball so that others can tell from your drawing that the ball is not a flat circle? This is the same problem a cartographer (map-maker) has when he or she wants to represent a hill or mountain on a flat map as if looking straight down on the landscape.

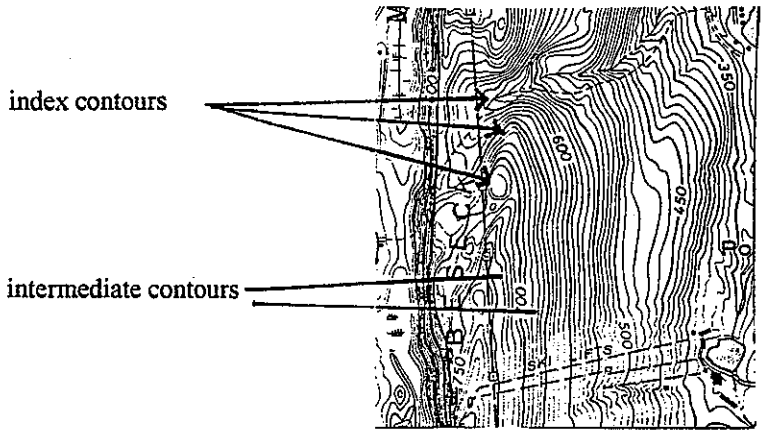
Topographic maps show the shape of a landscape using contour lines. These **contour lines** represent the same elevation for the entire length of the line on the map. **Elevations** refer to elevation above mean sea level (the level of the sea averaged over many years and many tidal cycles).[1] Topographic maps are often referred to as topos or relief maps.

Try to envision your favorite hill or mountain-top. Now, try to picture it as a simplified shape, such as an upside-down cone. To sketch the cone onto a topographic map, you could draw lines around the same elevations along the length of the cone. Then, you could stand over the cone, looking straight down, and draw those lines as you see them from above, so that the lines would look something like this:

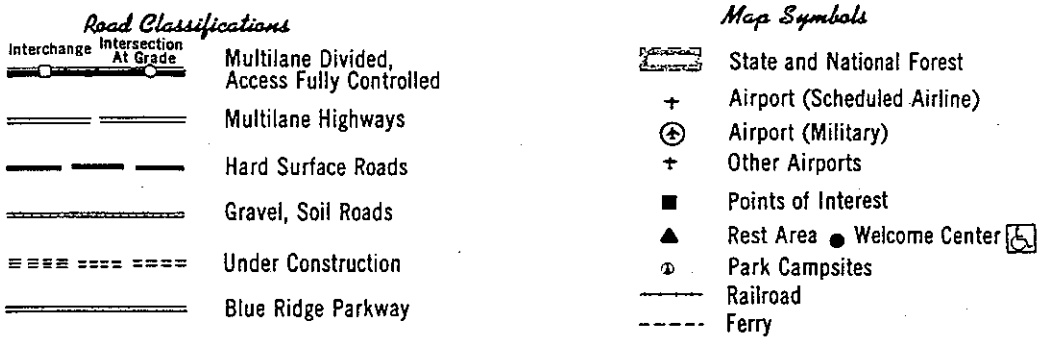


[1] Randall, Glenn. The Outward Bound® Map & Compass Handbook (Lyons & Burford: New York, NY) 1989. p.25.

To make the elevations easier to read, the contours are drawn so that every fifth line is heavier -- this fifth line is called the **index contour**. **Intermediate contours** fall in between the index contours. Topographic maps have different distances between the contour lines, called the **contour interval**, which can be 10 feet, 20 feet, or 100 feet in elevation, or some other value, so it is important to look at the legend on each topographic map to determine the contour interval. The contour interval can also be determined by looking at the elevations that appear along the index contour lines, which tell which elevation these lines represent.



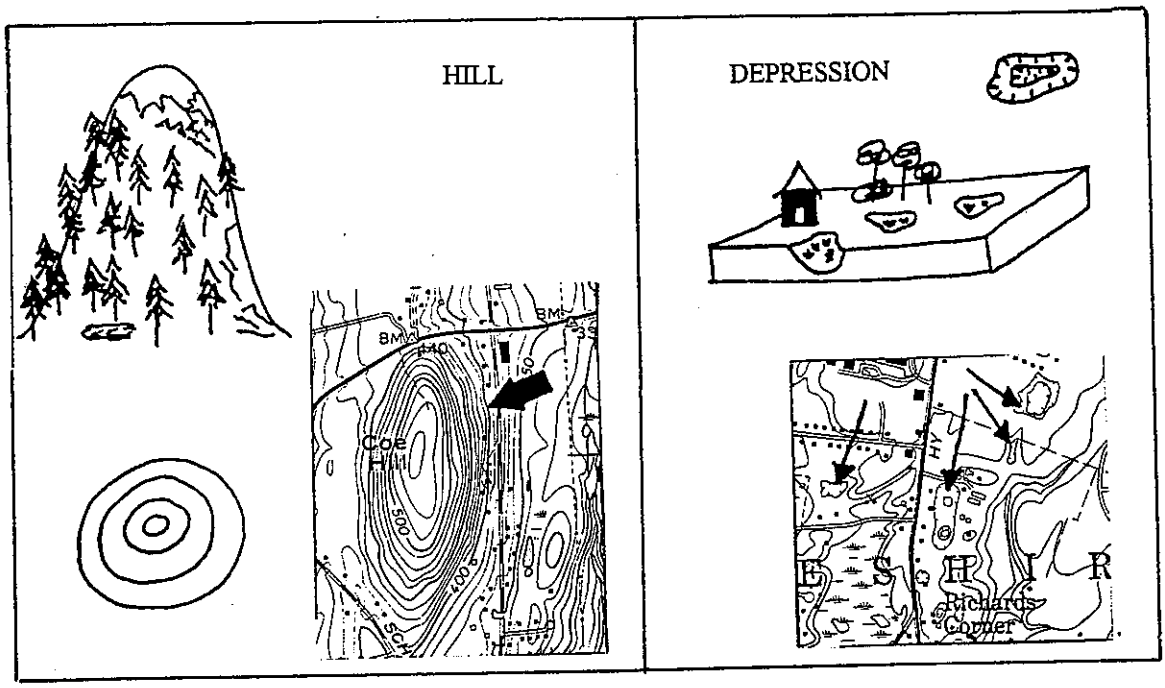
The **legend** explains the meanings of the symbols, colors and shapes used in the map. Symbols are used to represent various things on the map, such as rivers, roads and bridges. A pamphlet called "Topographic Map Symbols" (printed by the Department of the Interior U.S. Geological Survey National Mapping Division) is provided in the back of this workbook. It also gives addresses for where to obtain topographic maps from the U.S. Geological Survey.



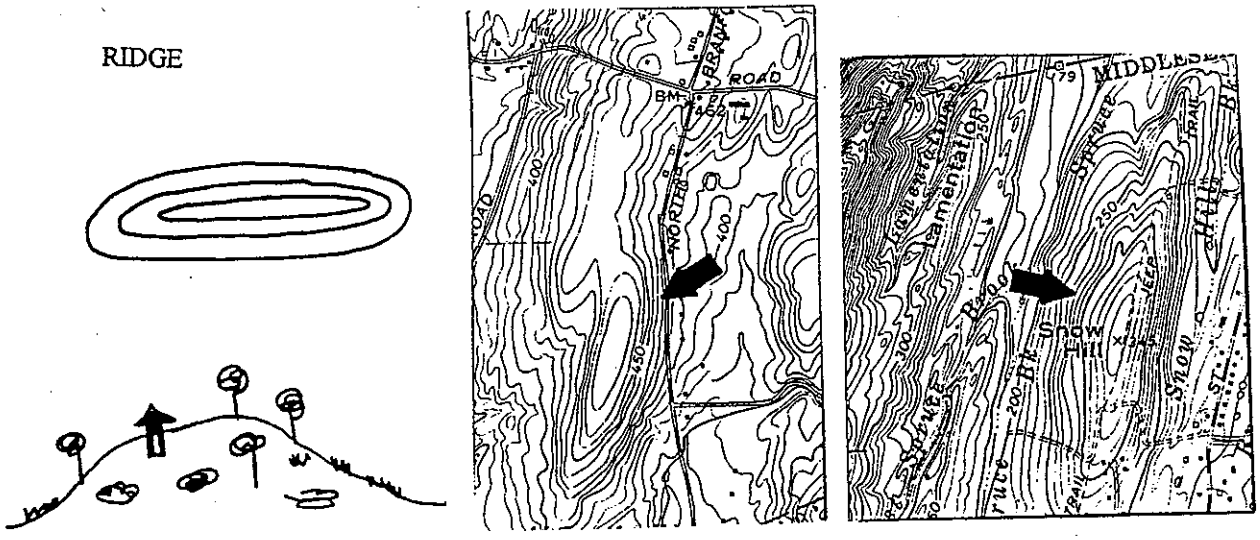
To figure out the location of something on a regular street map, street and road names are often used. Roads are also indicated on topographic maps. Topographic maps also show lakes, rivers and streams, mountains, town boundaries, and other helpful landmarks to help determine location. There are other ways to find a location on a topographic map, such as latitude and longitude, or by using a compass and compass directions. To learn more about these methods, please see the references in Appendix A.

Recognizing Patterns:

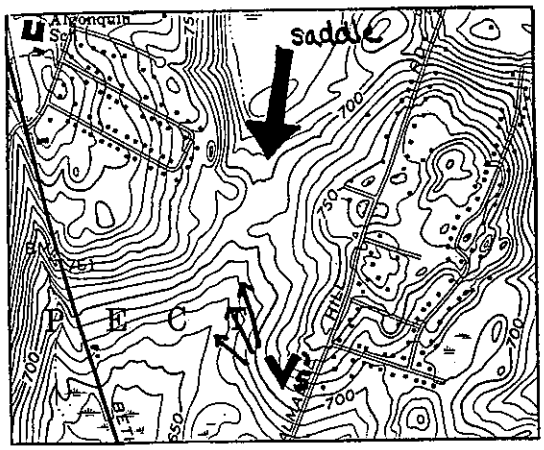
- **Whenever contour lines form smaller complete, closed loops like the ones above (even if they are not circular) they represent a hill or mountain area.** An exception to this is when a concentric line represents a shallow **depression**, in which case the cartographer draws in short, stubby, perpendicular lines:



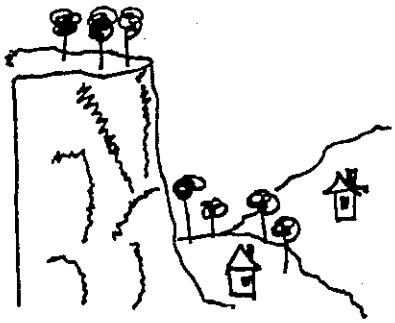
- Whenever there is a **ridge**, the contour lines on the map will form a shape that looks something like this:

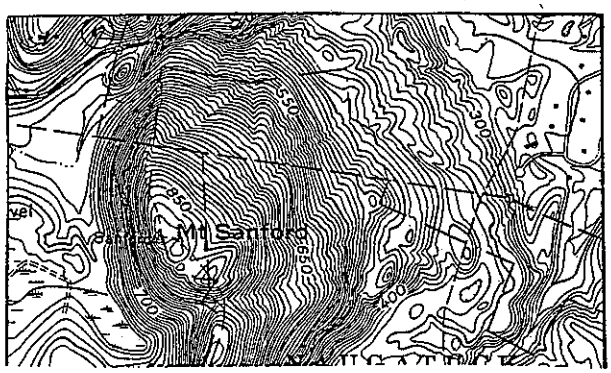


- If there are two ridges next to each other, the edges of the two ridges form a **saddle**. Between the two ridges, a **valley** may have formed, which is characterized by a V-shaped set of contour lines:

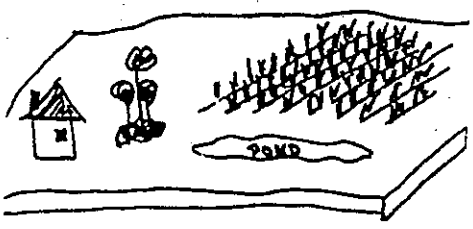


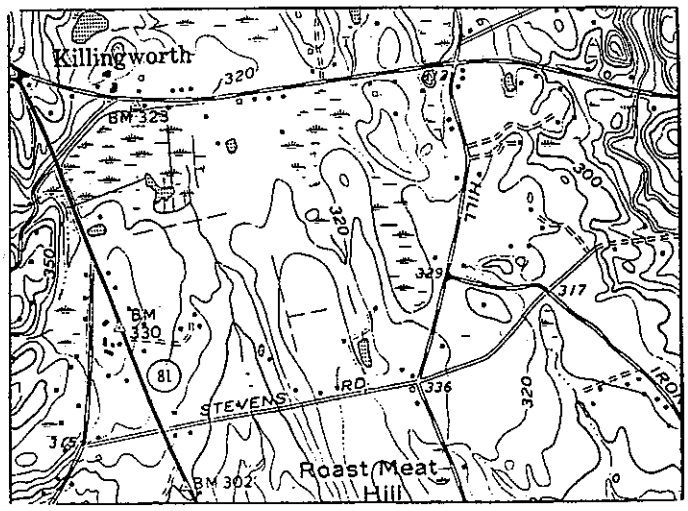
- Whenever there is a **steep slope**, the contour lines will appear much closer together:



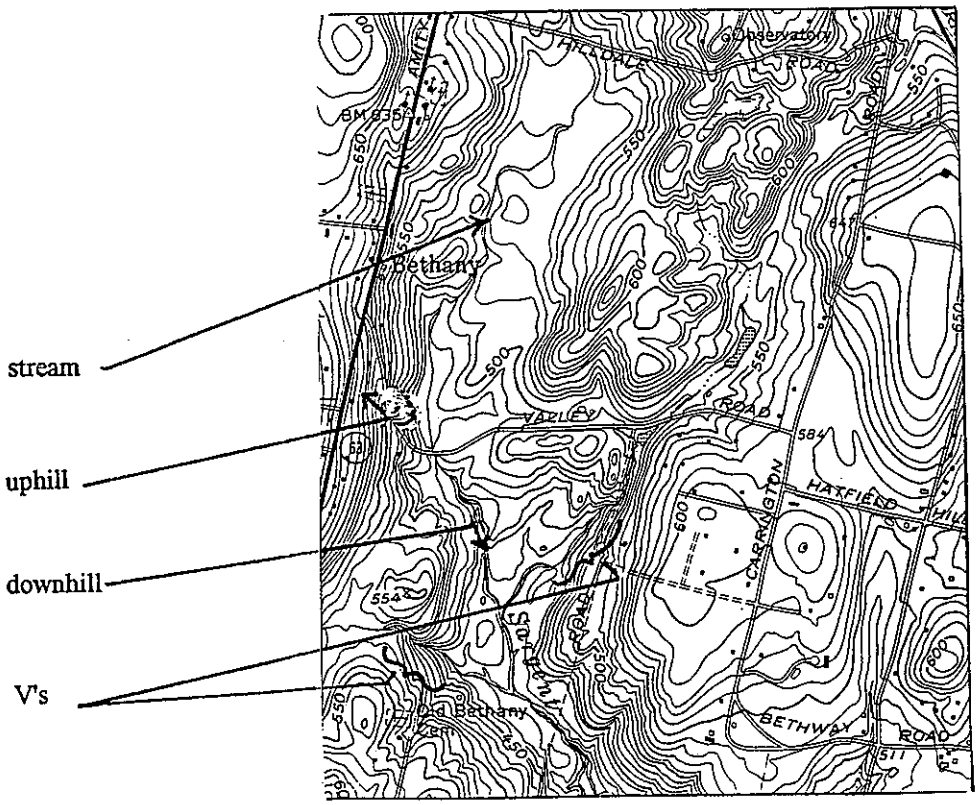


- When contour lines are spaced far apart, this means a slight change in elevation, and that the land is **nearly flat**:





- Another important pattern to recognize is that the **points of the V-s point uphill.** Streams are represented by thin blue lines on a topographic map (which appear black in this workbook). Can you locate the stream on the map below? When a stream is located on a topographic map, it will usually be located on the V-s, which represent valleys. The streams flow downhill, and the direction of flow can be determined by looking at the V's in the contour lines. Remember that the V-point gives the uphill direction, and **the stream will always flow opposite of the way the V's are pointing, and will flow downhill.** Note that sometimes the V's are softened into U-shapes.



Please see Appendix A for information on where to learn more about topographic map symbols and map interpretation.

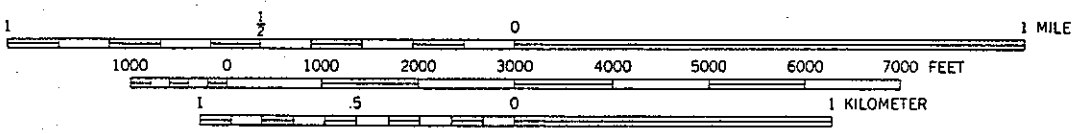
Distance and Scale

In order to draw the landscape onto a topographic map, or any map, it is important to understand the use of scale. For example, toy trains are scaled-down versions of real trains. A drawing of a landscape must also be a small version of the landscape in order to fit onto the map. The topographic map also shows the relative horizontal distance from one location to another point on the landscape.

The **scale** of a map is the relationship between the size of the actual area on the landscape and the size of the same area as represented on the map. In other words, 1 inch on the map is the same as 100 feet on the landscape. Maps have scales drawn or indicated somewhere on them, usually near or in the legend.

Representations of scale:

- Scale can be given on a map in two basic ways. The first way to illustrate scale is to draw a **graphical** representation - a line or bar divided into segments of length that represent units of length on the ground:



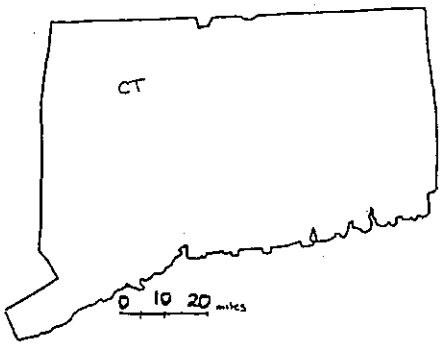
- Another way to show the map scale is to give a **fractional** representation, such as 1/1,000. This means the same as the **proportional** representation: 1:1,000. This type of scale is often used for aerial photograph-based maps (photographs taken from an airplane looking straight down at the land). When this scale is given, conversion charts are available to interpret the distance in feet or inches. A partial conversion chart is provided in Appendix B.

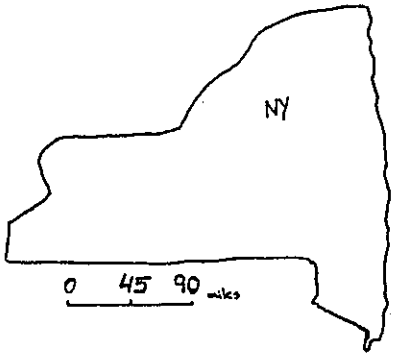
An important concept in looking at maps is that **although a map may be similar in size, if the scale is different, the distances represented by the maps will be very different.**

To understand this further, try to approximate the time it would take to drive across Connecticut from east to west in a straight line. To do this, measure the width of the state on the map, and then look at the legend to figure out the distance in miles on the land that this represents. If you drove at 55 miles per hour, then the conversion is:

$$\frac{1 \text{ hour}}{55 \text{ miles}} \times \_\_\_ \text{ miles} = \_\_\_ \text{ hours}$$

How long would it take to drive across New York State?





- When reading a map, keep in mind that **the more land surface being represented in the same amount of map space, the less detail can be illustrated in that map space.** In other words, large scale maps, like a site plan map at a scale of 1 inch = 100 feet, can show much more detail than a small-scale map, which might have a scale of 1 inch = 1 mile.

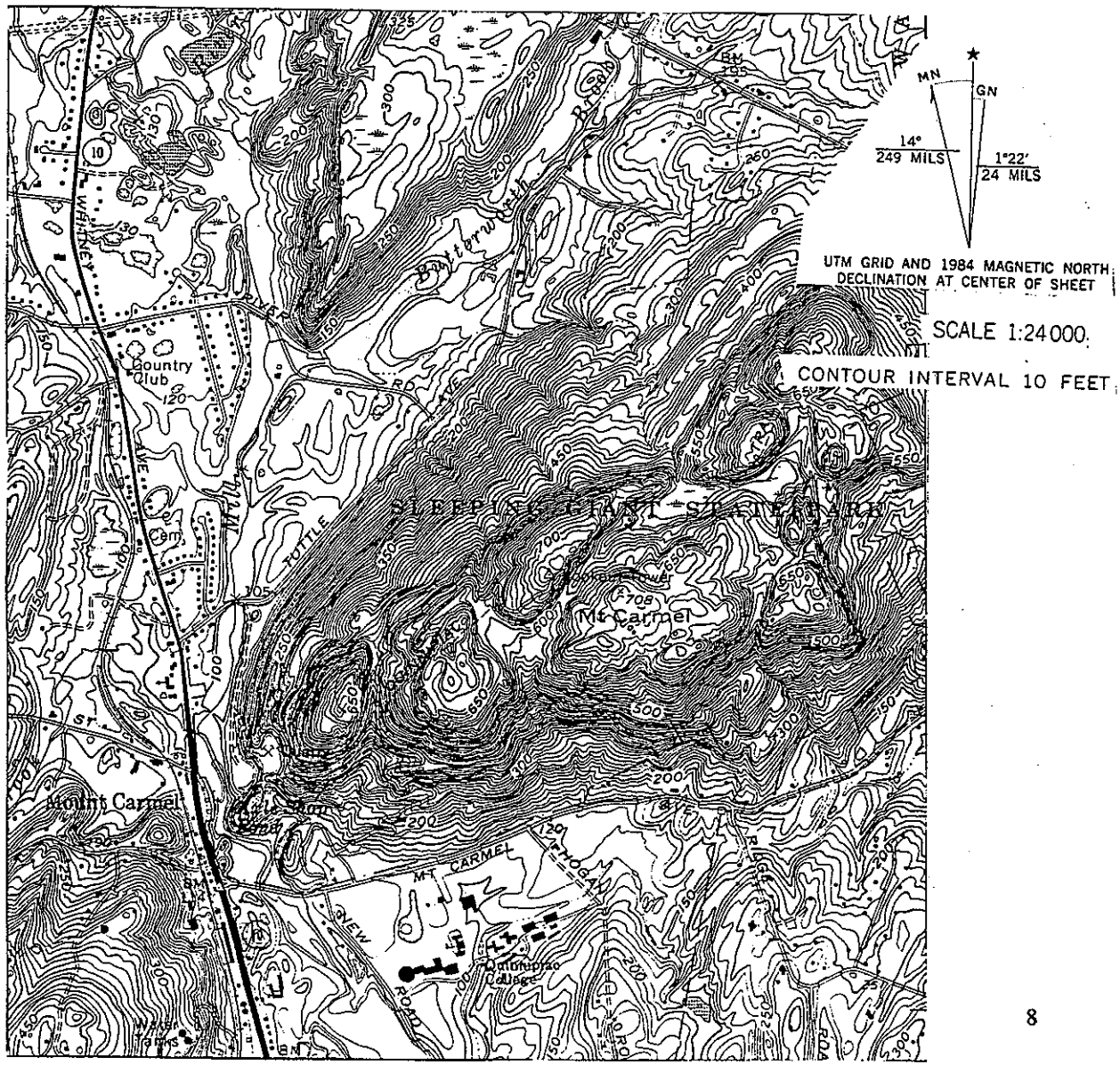
- Also, keep in mind that **not all maps have the north arrow pointing up.** Sometimes the map will fit better on the page if the north arrow points another way, such as on a site plan map, so always check to see which direction is north on the map.

Please see Appendix B for more detail on scale conversions and distance equivalents.

A Review

To review some of the concepts discussed so far, please try to answer the following questions about the topographic map below:

- What familiar shapes and patterns can be found on the facing topographic map? (ridges, valleys, saddles, steep slopes, flatter areas)
- What is the scale of the map?
- Where are there any marshy areas or depressions?
- Which way does Mill River flow?
- Is it easy to walk from Quinnipiac College to the Lookout Tower on Mt. Carmel?
- Why aren't there any houses on the southeastern side of the Quinnipiac Trail?
- What is the highest elevation on Mount Carmel?
- At what elevation is River Road where it intersects with Whitney Ave?
- How far is it from Axle Shop Pond to the Country Club?



Chapter 2 -- What other maps are useful when looking at a site plan to evaluate regulated activities and impacts?

In order to look at wetlands information with regards to a site plan, there are several other sources of information that can be helpful. Following are some brief discussions of some of the most common resources. These resources, when used in combination with the topographic map and site plan map, can be used to help identify areas of possible wetlands in and around the site, and the relationships they have to one another.

Please refer to the set of maps presented in the attached packet for a typical site plan location. These maps have been enlarged or reduced so that they are approximately the same scale, and have had reference to specific site location deleted.

- **Aerial photographs:** These can give information about current and past land uses, road locations, vegetation types and water resources. Black and white aerial photographs show changes in the shading of the vegetation, such as darker areas, watercourses and lakes and ponds can highlight areas where wetlands may be located. With a 60% overlap in the photographs, a stereoscope viewer can be used to see the landscape 3-dimensionally, which helps to highlight drainages and locations of low-lying land areas.

- **Soil Conservation Service Soil Survey Maps:** Units of different soil types have been mapped by the USDA Soil Conservation Service on a county basis, usually accurate to within 2-3 acres. County soil surveys contain soil descriptions and information about soil uses and characteristics, and can be used to locate soil types associated with wetlands.

- **Town (or State) Wetlands Map:** Wetland vegetation boundaries and/or soil types are often mapped by the state and sometimes by the town, with variable levels of information included.

- **National Wetlands Inventory Map:** These maps are part of a nationwide mapping of wetlands using aerial photography to locate the wetlands and map the type of vegetation in each wetland area. Water regime is also a part of the description, using the Classification of Wetlands and Deep-Water Habitats of the United States (Cowardin, et. al.). This information is laid out onto topographic maps.

- **Flood Hazard Map:** These maps are prepared by many different agencies. An example is the Federal Emergency Management Agency (FEMA) under the National Flood Insurance Program. Under this program, Flood Insurance Rate Maps (FIRM) have been created for many areas of the country, indicating hazard areas for the 100-year, 500-year flood events. Topographic information is omitted, but roads are included.

Please see Appendix C for a table of available resources and where they can be obtained.

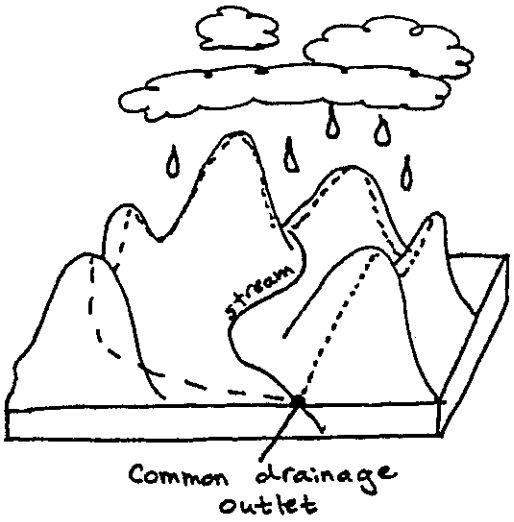
What impacts does scale have on using maps for site plan evaluation?

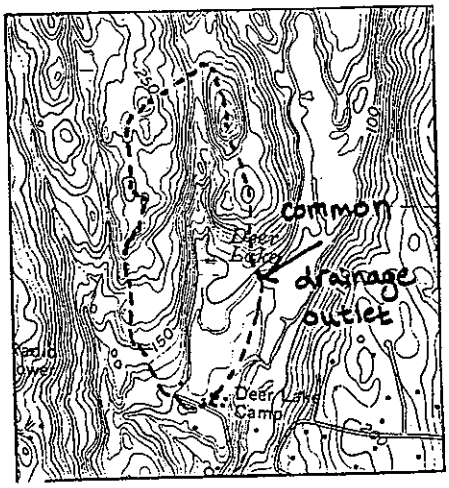
In the discussion of scale in Chapter 1, an important point is the issue of detail that can be mapped at different scales. As discussed earlier in this chapter, many of the maps used for gathering information about a particular site are at a much larger scale than the site plan contour map, and therefore contain less detail. Keep in mind that the county soil survey maps are able to maintain enough detail to be accurate to about +/- 2-3 acres. This means that an island of upland might be present, but if it is only 1 acre in size it will not be mapped on a soil survey mapped unit. It is important to look at the small scale maps with this perspective, and to be aware that this does not mean that the large scale maps are inaccurate, just drawn to a different scale.

To illustrate this concept, the national wetlands inventory, town wetlands, and state soils maps were enlarged to approximately the same scale as the site plan map of 1 inch = 100 feet, included in the attached packet. It is easy to see the level of detail that is included on a site plan map in comparison with the small-scale maps when looking at this set of enlargements. Often, better delineations of soil type, wetlands, and upland areas are indicated on the site plan map due to the level of detail available.

Chapter 3 -- What is a watershed?

A **watershed** is an area of land in which all the water that falls on the land area eventually drains to the same outlet. This might be compared to a large bathtub, with the drain being the point into which all the water eventually flows. Examples of drainage points for a watershed could be an outflow of a lake, or the mouth of a river, or any chosen point along a stream channel.[2] Watersheds are also known as **drainage basins**. Here is an illustration of a watershed:





Looking at the above illustration, and thinking about contour lines on a topographic map, try to imagine which way water would flow when it lands on the different points of the topographic map. Water will always flow downhill perpendicular to the contour lines. If a raindrop fell on the watershed boundary above, it would be landing on the **drainage divide**. If it is just inside the boundary it will drain into this watershed; or if it lands just outside the drainage divide it will drain into a different watershed. Which way does the water flow in this watershed (which way do the V's point)? Are there any possible intermittent streams (look for U's in the contour lines -- be careful to look at the elevations indicated to be sure the U-shape is not a ridge)?

2"Encouraging Conservation: A Region's Dedication to Clean Water." The Southern Rhode Island Conservation District. The Pawtucket Watershed Education Program, Curriculum Guide. March, 1993. p.4.

Why is a watershed important?

Development densities and land-use activities directly impact surface water quality, and it is important to have a clean supply of water. Much of the drinking water in Connecticut comes from surface supplies of water, such as reservoirs.

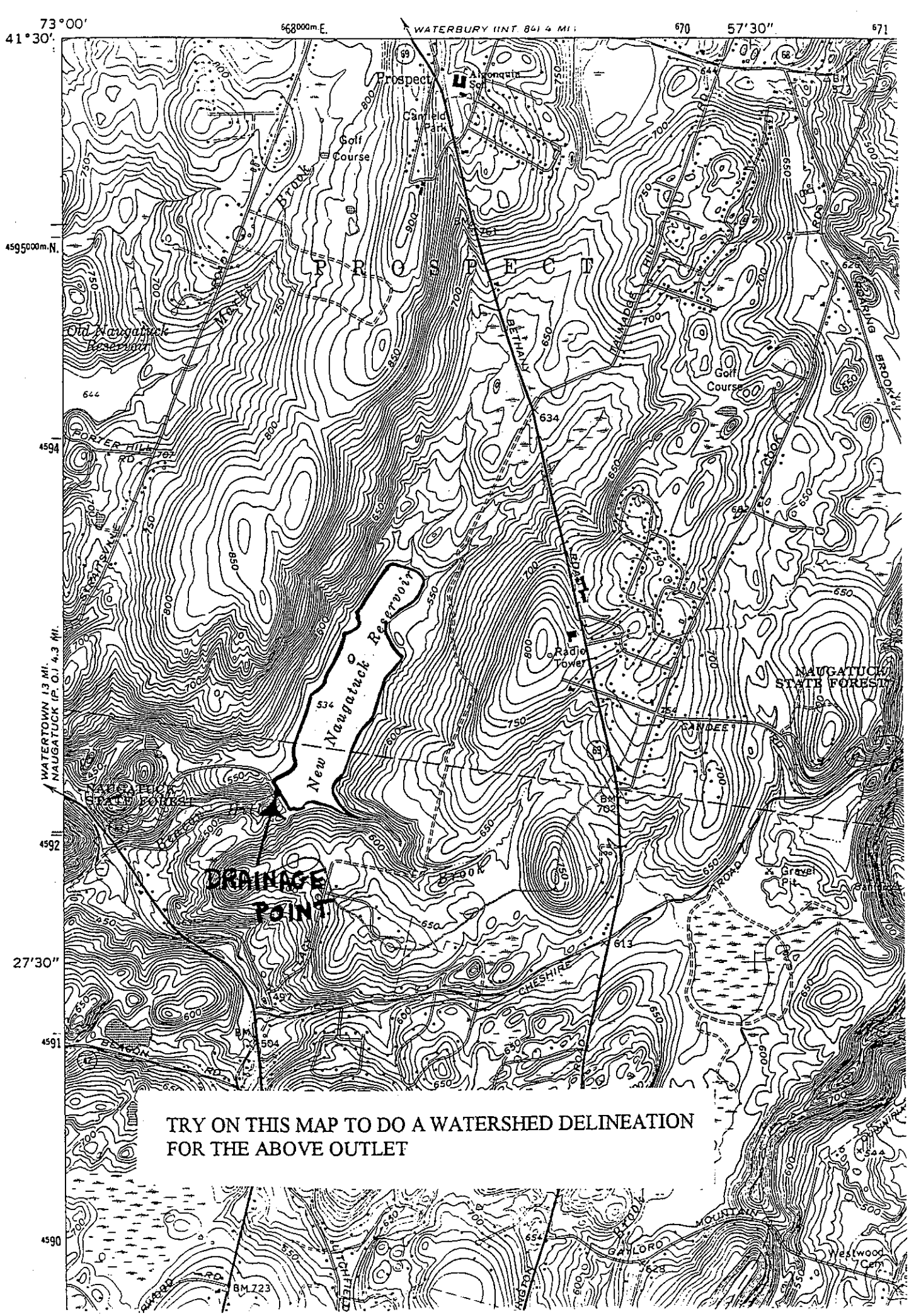
Section 25-37a of the Connecticut General Statutes highlights that a supply of clean water an essential priority for the state for health, safety, and economic values. Municipalities are encouraged to look at protecting watersheds that supply public surface water drinking water supplies in cooperation with the State. In 1985,

> ". . .the Connecticut General Assembly passed 'An act Concerning the Protection of Public Water Supplies.' Sections 8-2 and 8-23 require local planning and zoning commissions to consider the protection of existing and potential public water supplies in municipal land-use plans and regulations. . . .Watershed boundaries for all surface water supplies in Connecticut have been mapped by DEP and are contained in the publication, *Atlas of the Public Water Supply Sources & Drainage Basins of Connecticut*, available from the DEP Maps and Publications Office." (p. 1)

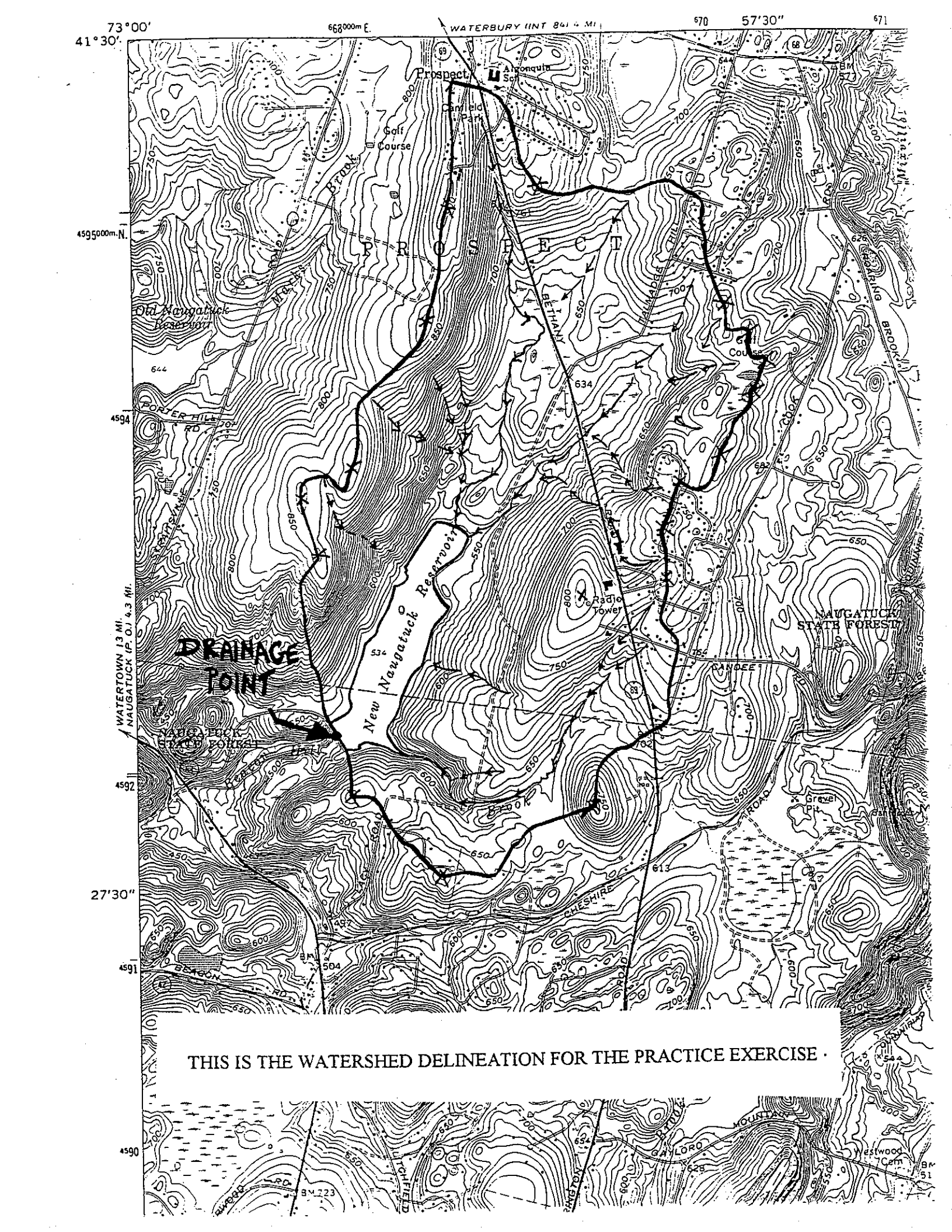
(Adapted from: Protecting Connecticut's Water-Supply Watersheds: A Guide for Local Officials. Doenges, James M., et. al. Ed. Connecticut Department of Environmental Protection, Department of Health Services, Office of Policy and Management, and Regional Planning Agency Association of Connecticut. Hartford, CT. January, 1993. pp. vi -1.)

How is a watershed delineated?

- A topographic map of the land area is needed. To preserve the map, either make a photocopy of it or use tracing paper or mylar to overlay the map for this process.
- Find the common drainage point you are interested in. (For this exercise, let's use the outlet of the New Naugatuck Reservoir). Draw a small circle or X around this point.
- Look at the V's and contour lines to determine which way the water is flowing. It is sometimes helpful to draw arrows on the map contours to highlight the way the water flows.
- Next, look for high points on the topographic map around the upstream side of the watercourse, and place X's on the high points (such as the top of a ridge or hilltop).
- Now you are ready to draw the watershed divide: start at the drainage point, and keeping the line perpendicular to the contour lines, draw a line to the nearest X, or high point.
- Connect the X's, and work your way around and back to the drainage point. This line will go through the saddles of the hills and ridges to the X's you have placed on the high points. If you get stuck, stop and imagine which way a raindrop would flow if it landed on that spot (remember to look at V's and U's in the contour lines). Sometimes a high point will be included within the watershed instead of being on the drainage divide, because water will flow down all sides of the high point and flow down to the common drainage point. In this case, the drainage divide will be further away from the outlet at another high point, and will not touch the high point completely included in the watershed.



TRY ON THIS MAP TO DO A WATERSHED DELINEATION FOR THE ABOVE OUTLET



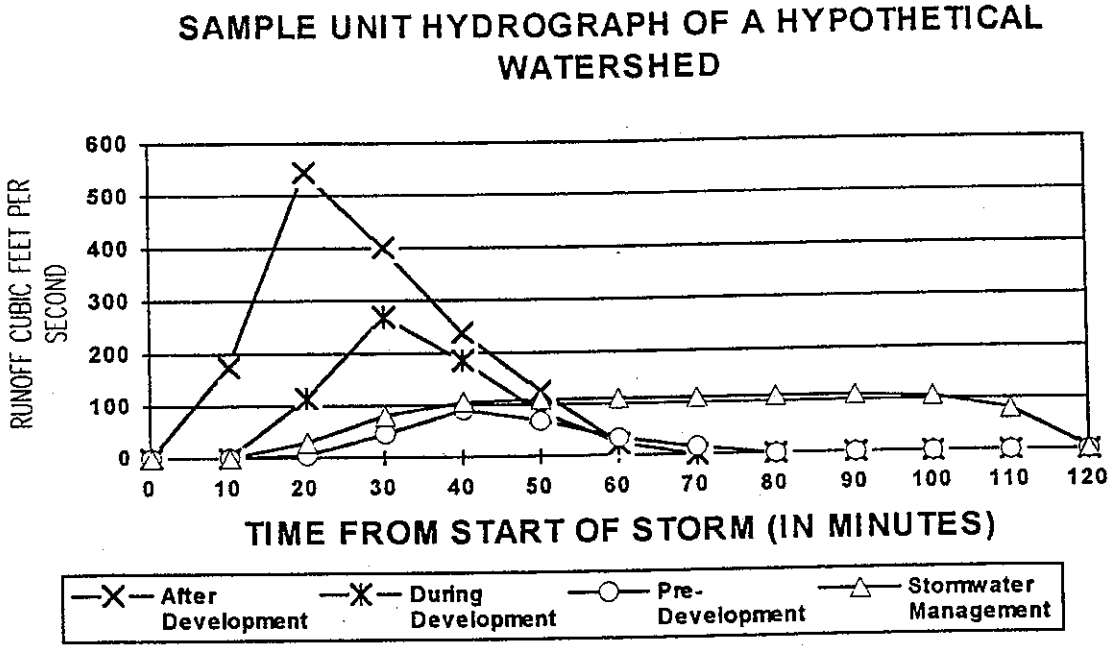
THIS IS THE WATERSHED DELINEATION FOR THE PRACTICE EXERCISE.

The watershed for the New Naugatuck Reservoir is delineated on the facing page. In looking at this watershed area, here are several questions to consider:

- What would be a good name for this watershed?
- Why is the reservoir nearly straight at the outlet point?
- Is there a road in the watershed? What concerns might there be about a road if the New Naugatuck Reservoir is a drinking water reservoir?
- Can you locate a golf course?
- Are there marshes in the watershed?
- Are there steep slopes in the watershed?
- What is the elevation of the highest point along the drainage divide?
- Can you locate a subdivision?
- What would happen if a subdivision on the drainage divide, using stormwater management systems, diverted all of its stormwater out of the watershed, changing the natural drainage divide?
- What function does the Reservoir play in flood protection?
- What other observations can you make about this watershed?

Chapter 4 -- What is a unit hydrograph?

A **unit hydrograph** is a way of graphically illustrating the difference in the amount of runoff resulting from a storm in a given area. The unit hydrograph characterizes a specific type of storm in a given watershed area (a 2-inch rainfall in two hours, for example), and shows how quickly runoff will build to its highest levels before tapering off once a storm begins.



Adapted from "Inland Wetlands," Guide Sheet 6B. Connecticut Department of Environmental Protection, Water Resources Division, Inland Wetlands Unit.

This unit hydrograph illustrates that:

- **prior to development**, peak runoff happened 40 minutes after the storm began at a level of about 80 cubic feet per second.

- **during development**, peak runoff occurred at about 30 minutes from the start of the storm, at a rate of approximately 280 cubic feet per second.

- **after development**, the peak is much greater, and happens much more quickly, at approximately 20 minutes from the start of the storm at 545 cubic feet per second, several times the peak flow prior to development.

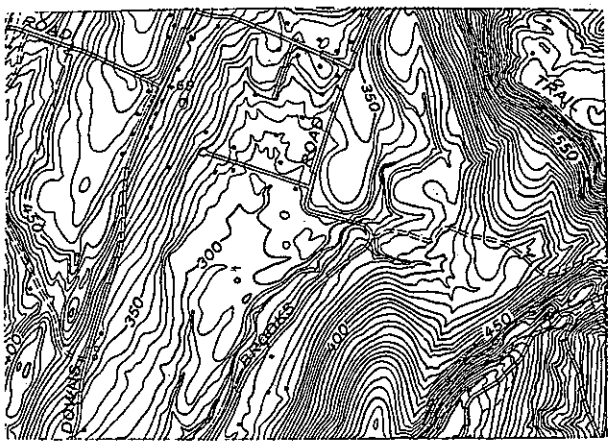
- **What is the peak discharge, and when does it occur, for stormwater management on the unit hydrograph above?**

Why does this happen?

Development of an area often means buildings, paved roads and parking lots. These are relatively impervious surfaces, meaning that rainfall will not be able to soak through them into the ground (infiltration). Instead, rainfall on these surfaces becomes surface runoff. Before development, this rainfall has more opportunities to soak into the ground. The same amount of rainfall before development may mean more surface runoff once an area is developed. This surface runoff is channelized into culverts and storm drainage systems, and can be retained with good stormwater management to minimize the level of the peak discharge, thus avoiding possible damage from the larger amounts of surface water leaving the area.

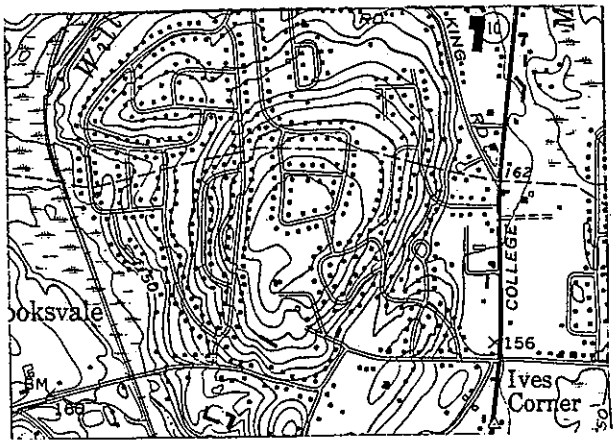
PRE-DEVELOPMENT:

more infiltration,
less runoff



POST-DEVELOPMENT:

more runoff,
less infiltration



Chapter 5 -- What is GIS?

GIS stands for Geographic Information System. A GIS is a computerized mapping and evaluation system. Nationally, GIS is becoming the new mapping standard.

Mapping information like soils, town boundary lines, reported pollution events, watercourses, wetlands, aerial photograph images, flood hazard zones, watersheds, agricultural land, subdivisions, utilities, aquifers and other kinds of information are input into the software system. Once this information becomes digitized and available on a GIS, customized information can be overlaid, at the same scale, onto a printout or computer screen, for large areas or small ones. Evaluation of land use management and planning decisions on a watershed, town, ecosystem or other basis can be assisted by using this software.

There are several kinds of GIS software. The state of Connecticut is using ARC/INFO, and ArcView software. The ARC/INFO is where digital inputs and manipulation take place. ArcView accesses the ARC/INFO data in an overview format, so that much of the information can be manipulated on a terminal screen to create area maps and information about land use and other desired information. Connecticut is currently in the process of inputting the statewide soil survey information into a GIS system, to be available for proper use at a 1:12,000 scale. Many towns throughout Connecticut are beginning to obtain GIS software and beginning the process of inputting the available information.

Appendix A

Some suggested further reading on map interpretation:

"Encouraging Conservation: A Region's Dedication to Clean Water." The Southern Rhode Island Conservation District. The Pawtucket Watershed Education Program, Curriculum Guide. March, 1993.

Land Navigation Handbook: The Sierra Club Guide to Map and Compass. Kals, W.S. Sierra Club.

The Outward Bound® Map & Compass Handbook. Randall, Glenn. Lyons & Burford, New York, NY. 1989.

Modern Physical Geography, 3rd Ed. Strahler, Arthur N. and Alan H. Strahler. John Wiley & Sons. New York, NY. 1987.

"Topographic Map Symbols." United States Department of the Interior, U.S. Geological Survey, National Mapping Division. Denver, CO.

Appendix B

MAP SCALES AND EQUIVALENTS

Fractional Scale	Feet per inch	Inches per 1000 feet	Inches per mile	Miles per inch	Meters per inch	Acres per square inch
1:500	41.667	24.00	126.72	0.008	12.700	0.0399
1:1,000	83.333	12.00	63.36	0.016	25.400	0.1594
1:10,000	833.333	1.200	6.336	0.158	254.000	15.942
1:12,000	1000.00	1.0	5.280	0.189	304.801	22.957
1:24,000	2000.00	0.50	2.640	0.379	609.601	91.827
Formulas	Scale / 12	12,000 / Scale	63,360 / Scale	Scale / 63,360	Ft. per in. X 0.3048006	(scale squared) (43,560 x 144)

Adapted from Soil Manual for Site Evaluations in New Hampshire, 2nd ed. USDA Soil Conservation Service, Durham, NH and NH Dept. of Environmental Services Water Supply and Pollution Control Division, Concord, NH. December, 1991. Appendix B-2.

Conversion Factors:[3]

1 inch = 2.54 centimeters
1 foot = 30 centimeters
1 yard = 91 centimeters
1 mile = 1.61 kilometers

12 inches = 1 foot
5,280 feet = 1 mile
640 acres = 1 square mile

[3]Randall. p. 110.

Appendix C

In Connecticut, there are many resources available from:

Natural Resources Center
Office of Publications and Sales
Department of Environmental Protection
79 Elm Street (Basement Level)
Hartford, CT 06106

Suggested further reading for map resources and ordering information is:

The Connecticut Natural Resources Information Directory & List of Publications for the Natural Resource Center & Geological & Natural History Survey of the Department of Environmental Protection of the State of Connecticut. 1991. Prepared by Alan Levere. This provides a well organized, categorized and thorough description of the various maps, photographs and publications available from the Natural Resources Center.

In addition to the Office of Publications, topographic maps be ordered from:

Western Distribution Branch
U.S. Geological Survey
Box 25286, Federal Center
Denver, CO 80225

The U.S. Geological Survey also supplies a **map index** for each state, which contains a **list of private map dealers within the state.** The map index provides information for ordering the map that covers specific areas of the state. There is also a **Catalog of Topographic and Other Published Maps** for each state. Both are free.

Below is a generalized table which helps to clarify scale, uses and availability of certain kinds of maps with regards to wetland protection.

Table is from p. 34 "**Protecting National Wetlands.**" Burke, David G., et. al. American Planning Association, Planning Advisory Service. Report #412/413. Chicago, IL. 1988.

Title of Data Source	Information Displayed	Scale	Suggested Wetland Uses	Source
National Wetlands Inventory Maps	A wide variety of information pertaining to vegetation, water regime, and other parameters.	1:24,000 1:100,000	1. Regulatory Mapping. 2. Aid in processing permits. 3. Acquisition. 4. Siting,.	U.S. Fish and Wildlife Service and the Geological Survey
USGS topographic maps (7-1/2' and 15')	Topographic contours, major roads, railroads, utility lines, contours, water bodies, houses, town names, county and town boundaries, vegetated and non-vegetated wetlands.	1:24,000	1. Enlarged for use as wetlands base map. 2. Interim wetland map. 3. Watershed boundaries. 4. Source of topographic information.	U.S. Geological Survey
SCS Soil Survey	Soil Types	Range from 1" = 600' to 4" = 1 mile	1. Interim wetland map. 2. Determination of soil suitability for onsite waste disposal. 3. Determination of soil structural bearing capacity.	USDA Soil Conservation Service
State Wetland Maps	Wetland vegetation boundaries. Varied (depending on state).	1:2,400 to 1:24,000	1. Interim wetland regulation maps. 2. Permanent wetland maps (depends on scale).	State wetlands programs

TABLE IS CONTINUED ON FOLLOWING PAGE

(TABLE IS CONTINUED FROM PREVIOUS PAGE)
Table is from p. 34 "**Protecting National Wetlands.**" Burke, David G., et. al. American Planning Association, Planning Advisory Service. Report #412/413. Chicago, IL. 1988.

Title of Data Source	Information Displayed	Scale	Suggested Wetland Uses	Source
Flood Hazard Boundary Maps: USGS, HUD	Flood-prone areas.	Approx. 1:24,000	1. Interim mapping of wetlands. 2. Assess flood-hazard potential at wetland sites.	Federal Emergency Management Agency (FEMA) Also, state agency responsible for flood management
Floodplain Information Reports. Army Corps of Engineers	Standard project floodplain, 100-year flood evaluation wetland boundaries (some maps).	Range from: 1" = 500' to 1" = 1,000'	1. Assess flood hazard at potential sites.	Army Corps of Engineers Flood-Plain Management Services
USGS, Hydrologic Investigations, Atlas, Hydrology & Water Resources	Each map differs and may contain: wells, test holes, bedrock, groundwater quality information.	1:24,000	1. Determine groundwater flow systems. 2. Determine aquifer recharge areas.	U.S. Geological Survey Distribution Office.
Subdivision Maps	Dimensions of property, size and location of house, width of easements. Wetland floodplain boundaries (some circumstances).	1" = 40' 1" = 60' 1" = 100'	1. Determine precise wetlands boundaries (some instances). 2. Evaluate individual developments.	Municipal offices.
Air Photos Various Sources	Existing uses, vegetation, water resources, roads (black and white stereoscope).	Range from: 1:7,200 to 1:58,000	1. Define wetland boundaries based upon vegetation. 2. Use as base maps. 3. Evaluate individual proposed uses.	USGS USDA ASCS States Private

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Correspondence

Porous Pavements Q&A

Answers from the man who wrote the book on the subject

By Bruce K. Ferguson

Robert Ott

As the use of porous pavements grows, designers and agencies all over North America are learning for the first time this new approach to stormwater management. People like me have been asked to speak to them hundreds of times in the last five years, in workshops, webinars, consulting sessions, and agency testimonies and reviews. The questions that are raised from all the diverse groups have a lot in common.

Since 2005, I have saved 230 files of porous pavement questions conveyed in e-mails, telephone calls, and conference question-and-answer sessions. This article summarizes the questions that I have received most commonly over the years. My answers to them are based on 12 years of research and experience in the field, including surveying research reports, interviews with national experts, and firsthand observations in the field.

Correctly designed, installed, and maintained pervious pavements have surface infiltration rates higher than that of almost any natural soil.

There is a huge amount of knowledge about porous pavements now, and it is continuing to grow rapidly. The questions reported here are what people most frequently say they need to know.

Q: Is there a recognized measure, or index, of permeability for paving materials?

A: Pervious concrete and permeable pavers that are properly designed, installed, and maintained have surface infiltration rates of 140+ in/hr. An example of research suggesting this is "Study on the Surface Infiltration Rate of Permeable Pavements," accessible through the North Carolina State University Web site listed at the end of this article.

Q: What is the runoff coefficient?

A: Almost the only runoff coefficient that has ever been measured on properly built porous pavements is zero: There is no runoff, because the surface permeability is so high. But surface runoff coefficient does not take into account the limited capacity of the pavement's base reservoir: In a long, intense storm, the base could become saturated and overflow, either across the surface or through a perforated drainage pipe if one is provided. At that point, the pavement would in effect be generating runoff. So it would be prudent to use some positive number—not zero—for the runoff coefficient. An example would be to set the runoff coefficient equal to that of the local jurisdiction's "predevelopment" condition, which might be forest, meadow, or grass. To assign a coefficient larger than predevelopment would be arbitrary. A predevelopment grass surface generates some runoff during large storms, so it provides a valid analogy for porous pavement hydrology.

Q: How much credit should be given for the pavement as a "pervious" surface?

A: Correctly designed, installed, and maintained pervious pavements have surface infiltration rates higher than that of almost any natural soil, and several times greater than the maximum possible rainfall intensity anywhere in the country—in other words, greater than anything that is already called "pervious." So a surface of this type must be given complete credit for "100% perviousness," as would a meadow or forest. Giving it any credit less than 100% pervious would fly in the face of scientific evidence.

Just make sure that your pavement is selected, designed, installed, and maintained correctly.

Q: What is involved in maintaining the pavement "right"?

A: If you are in a municipality where sand or cinders are spread on the roads for winter traction, then vacuuming will be necessary at least once per year: in the spring, following snowmelt. The key word is vacuuming, with or without simultaneous washing, to lift material out and restore the open, permeable pores. Any washing or sweeping without simultaneous vacuuming would just drive sediment farther down into the pores. In areas where there is no sanding or other routine source of sediment, no special maintenance is needed except when something happens such as construction vehicles tracking sediment onto the surface; then the sediment can be removed by vacuuming.

Q: How long will the system last before it becomes a "non-permeable" surface?

A: Just make sure that your pavement is selected, designed, installed, and maintained correctly. If you are duly careful with all these steps, then the installation should be permeable indefinitely.

Q: Pretreatment using a filter strip or vegetated swale is required, right?

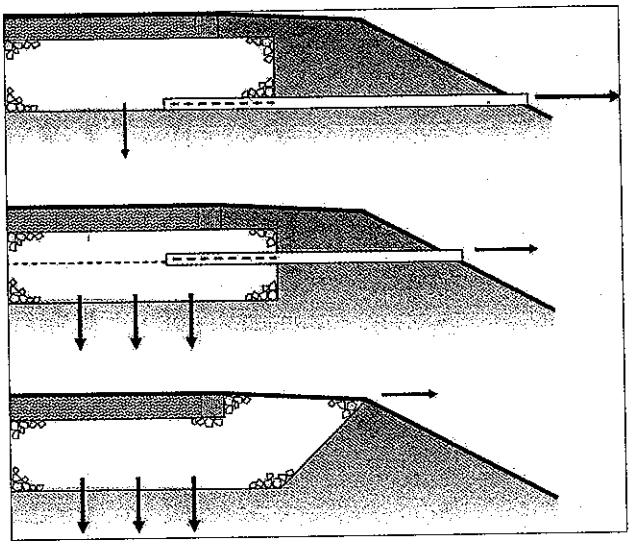
A: Absolutely not: Don't do that! Any upstream soil, even soil that is grassed or mulched, can erode and generate pavement-clogging sediment sometime. Adding a grass strip or forebay would just add more erodible upstream soil. Wherever earth drains down toward a pavement edge, a swale should be added to divert runoff and sediment away from the pavement. It is okay to drain impervious roofs or pavements directly

Bruce K. Ferguson

Permeable pavers in Minnesota correctly installed with highly permeable single-sized aggregate in the joints

Bruce K. Ferguson

A vital step in correctly installing pervious concrete is covering it quickly with plastic sheets and keeping it covered for seven days.



Right: Options in discharging excess water from a porous pavement's base reservoir

onto a porous pavement, because those surfaces don't produce sediment the way soil does.

Q: Should porous pavement be avoided where trees are present? Should overhanging trees be removed?

A: The only thing overhanging trees do to porous pavements is deposit their annual drop of organic debris. The debris decomposes to a minute fraction of the volume it started with. Vacuuming might be called for after a number of years, to reopen the pavement's pores. Trees are immensely helpful for water resource management, counteracting the urban heat island, shading urban open spaces, and absorbing carbon, and they should not be discouraged.

Q: What is recommended when you have a large chemical spill or hazardous material spill?

A: The same as if a spill occurred anywhere else in your city: Immediate and complete cleanup is the legal responsibility of the industry that spilled it, at their expense. No pavement or drainage anywhere is designed for this contingency, outside of the grounds of the industry that produces the chemicals.

Q: What are the risks associated with hydrocarbon (oil) contamination?

A: Letting oil into a porous pavement's voids is the whole idea in water-quality improvement. In the pavement, naturally occurring microorganisms biodegrade hydrocarbons before they migrate to the bottom of the pavement. The constituents go off as carbon dioxide and water vapor, and very little else; the hydrocarbons cease to exist as water-quality pollutants. An example of the research suggesting this, accessible on several Web archives, is C. Pratt's 1999 paper, "Mineral Oil Bio-Degradation Within a Permeable Pavement: Long Term Observations."

Q: What's the use of porous pavement on a clay soil, or where there is a shallow water table, and water cannot be absorbed into or treated in the soil? Is a subdrain necessary to ensure good performance? Can a porous pavement work here?

A: On clay soils, permeable pavements do not make the 100-year storm disappear; a perforated drainage pipe is ordinarily required to discharge excess water. But most of the water-quality benefit of any permeable pavement occurs within the pavement structure, without

Deicing salt does not clog porous pavements. The whole idea of deicing agents is that they dissolve readily in snow and water.

regard to the underlying soil; the soil is only a redundant "backup" system. Porous pavements on clay soils do:

- Reduce runoff coefficient and impervious cover
- Detain peak flows
- Treat water quality
- Recharge aquifers by gradual infiltration of rainwater from small, frequent, year-round storms

Q: What is the cost difference between standard and porous pavements in the same situation?

A: Pervious concrete costs approximately 20% more than conventional impervious concrete, because of its high cement content and specialized quality control. Permeable pavers cost about the same as pervious concrete. When you use these materials intelligently in a site plan to absorb and treat stormwater, and the municipality gives you credit for their stormwater functions, then the use of porous paving ordinarily reduces total development cost by reducing or eliminating the need for additional stormwater facilities.

Q: How does the use of pervious concrete affect the pavement life in cold climates?

A: Properly installed pervious concrete is free from freeze-thaw issues as long as the surface concrete layer drains freely down into an open-graded aggregate base, thence rapidly into the soil or a perforated drainage pipe. The material's durability is ensured by adequate strength, which comes from proper installation; further help comes from air entrainment and reinforcement with polymer fibers.

Q: Salt used for deicing... does it clog the paving?

A: Deicing salt does not clog porous pavements. The whole idea of deicing agents is that they dissolve readily in snow and water, lowering the water's thawing temperature. The dissolved salt flushes through with meltwater and does not accumulate. Ongoing research at the University of New Hampshire suggests that many porous pavements require less salting than impervious pavements, because the thawed meltwater drains so readily away through the pores.

Q: Do you use traditional trench backfill material under porous pavement, or do you use open-graded material instead?

A: The base material must be open-graded (single-sized) aggregate such as ASTM No. 57, so it can store and convey water.

Q: Are there standard specs (DOT type) for pervious concrete?

Porous pavements are still a small proportion of the paving being done in the world, but they are growing at an exponential rate.

A: The American Concrete Institute has adopted Specification 522.1, Pervious Concrete. In addition, the National Ready Mixed Concrete Association has a specialty certification program to help identify qualified pervious concrete installers. It is vital that industry standards such as these be followed—failures have occurred where established standards have been ignored.

Q: We need options for cost, appearance, etc.

A: A material that deserves to be used more is permeable pavers, also known as open-jointed block or PICP (permeable interlocking concrete pavement). These are manufactured units with openings in the joints where single-sized aggregate gives the pavement its permeability. Pavers manufactured to ASTM standards (as almost all of them are) are extremely strong and durable units. It is rather easy to install them correctly—just stick to the long-established guidelines of the Interlocking Concrete Pavement Institute. This is not the same construction as bricks on sand! Firmly specify that only single-sized aggregate must be used for the base, setting bed, and joint fill.

Q: For what parts of the country are porous pavement available, in terms of freeze-thaw, etc.? What site conditions, such as soil type, limit its use?

A: Properly selected, designed, constructed, and maintained porous pavements work wherever they are located. Improperly selected, designed, constructed, and maintained ones do not.

Q: How widespread is this usage? How much (and how rapidly) is it changing? What is the future for widespread adoption?

A: Porous pavements are still a small proportion of all the paving being done in the world, but they are growing at an exponential rate. Developers and suppliers are ready to install these new materials; their motivation is to meet today's environmental requirements in economical ways. The potential future application of porous paving is vast.

Q: What can my municipality do to encourage the use of porous pavements?

A: Make sure your municipality is not an unnecessary impediment. When a developer proposes porous paving, give it credit for what it can do to satisfy your stormwater requirements: It reduces impervious cover; lowers the runoff coefficient; and absorbs, detains, and treats stormwater.

Q: Where might I find research reports? I need data.

A: Watch Web sites such as the following for broad new information, links to detailed sources, and continuing updates:

- Concrete Pavement Technology Center: **www.cptechcenter.org** (search for "pervious")
- Interlocking Concrete Pavement Institute: **www.icpi.org**
- PCA Southeast: **www.secement.org/pervious_concrete.htm**
- Pervious Concrete: **www.perviouspavement.org**
- North Carolina State University: **www.bae.ncsu.edu/info/permeable-pavement**
- University of New Hampshire: **www.unh.edu/erg/cstev**
- Many additional Web sites run by proprietary suppliers

Bruce K. Ferguson is the Franklin Professor of Landscape Architecture at the University of Georgia and a member of Stormwater's editorial board. He is the author of the 2005 book Porous Pavements.

APPROVAL OF MINUTES

January 19, 2010, February 2, 2010 & February 16, 2010

Inland Wetlands and Watercourses Meeting

INLAND WETLANDS AND WATERCOURSES AGENCY
MINUTES OF A REGULAR MEETING
TUESDAY, January 19, 2010

A Regular Meeting of the Enfield Inland Wetlands and Watercourses Agency was held on Tuesday, January 19, 2010 in the Enfield Room, Enfield Town Hall, 820 Enfield Street, Enfield, Connecticut.

MEMBERS PRESENT:	Douglas Maxellon, Chairman Joseph Albert, Alternate Karen Camidge Robert Lemay Jo-Marie Nelson Brian Peruta Patrick Szczesiul, Alternate (seated)
MEMBERS ABSENT:	Robie Staples
ALSO PRESENT:	Katie Bednaz, Wetlands Agent Susan Berube, Recording Secretary

REGULAR MEETING

1. Call to Order: The meeting was called to order by Chairman Douglas Maxellon at 7:33 p.m.

2. Roll Call: Present were: Chairman Maxellon and Agents Albert, Camidge, Lemay, Nelson, Peruta and Szczesiul. Also present were Katie Bednaz, Wetlands Agent and Susan Berube, Recording Secretary.

3. Pledge of Allegiance: The Pledge of Allegiance was recited.

4. Executive Session
(Matters regarding specific employees, pending litigation, acquisition of real estate and / or matters exempt from disclosure requirements): None.

Chairman Maxellon seated Agents Albert and Szczesiul as full voting members for the public hearing and remainder of the regular meeting.

5. Public Hearing
a. **IW-533 - Town of Enfield** - is requesting a permit to reconstruct Post Office Road and Town Farm Road beginning on Post Office Road, 175-feet east of Raffia Road and ending on Town Farm Road, 150-feet east of Abbe Road within the regulated area (Map 86 Lots:169, 155, 293, 291, 158, 150, 167; Map 71, Lots: 1, 25, 27; Map 68, Lots: 161, 164, 153, 151, 152, 197).

Submitted 11/23/09, received 12/01/09, PPE 12/15/09, **MPHCD 1/19/10.** Mr. Piya Hawkes, Town of Enfield and Mr. Jeff Lemay of the Maguire Group represented the applicant.

Mr. Lemay distributed copies of the written response to comments by Staff and from the Agency's last meeting. He also provided updated plans.

Mr. Lemay reviewed each of the points in response to Ms. Bednaz's Agent Review.

This included the following:

- The soil scientist's certification and signature have been added to the plans;
- The mitigation plan includes monitoring for the 1st 5 growing seasons and can be extended if remedial measures are required within 2 years of the end of the initial monitoring period; photos of the monitoring plots will be taken; the plans have been revised to show monitoring plots to be 10 meters square in size. Monitoring will be conducted at the same time each year, in the spring and fall.
- Inspections will be conducted according to the specifications recommended by the Wetlands Agent;
- The shooting range is not located within the work area and will continue regular operations.
- The project has been designed to maintain the existing hydrology patterns, except in the instance of elimination of the outfall at the Holy Family Church property. Drainage to wetland C & D will be increased slightly but will not negatively impact them since most of the additional water will flow through the wetlands into the Scantic River. The increase will not negatively affect the property to the west since most of that property is elevated above the wetlands; it will not negatively impact the property to the east because the increase is minimal and the area is already prone to frequent flooding from the Scantic River.
- The potential vernal pool should not be affected since the hydrology within wetland I will not be significantly altered.
- The staging area has been added to the plans.
- The contractor will reconstruct no more than 500 linear feet per week. Catch basin tops will be elevated at least 1.5" above the roadway surface until the end of the project, when the final course of pavement will be installed.
- A Storm water Maintenance Plan is now included in the plans.
- The storm water outfall at station 50+100 has a proposed level spreader weir to dissipate discharge flows and promote sheet flow. No disturbance of the channel flows is anticipated.
- Non degradable erosion control matting has been added to the area of the berm for water quality basin #2;
- A note has been added to the erosion and sediment control plan that no vehicles or fluid filled materials be stored within 50' of wetlands or

watercourses.

- Concrete washout procedures have been addressed in note #6 of the Erosion & Sediment Control Plan;

Mr. Lemay added that Ms. Bednaz will be provided a full set of the updated plans.

Also, hay bales will surround catch basins located off of the roadway.

The storm water maintenance plan is now on the plans as well as provisions for short and long term maintenance.

Swales and basins are located within the Town's right-of-way.

The applicant is still working on the best way to access the area on the east side of the bridge for maintenance. At worst, the guide rails would need to be temporarily removed.

Mr. Lemay reported that the project has gone out for bids; bid opening will be this Friday.

Mr. Hawkes added that once a contractor has been chosen, funds from the State need to be obligated by March 2, 2010.

Mr. Lemay stated that he has had informal communications with the Army Corps of Engineers and expects final approval this week.

Planning & Zoning will receive the application this week and will be on their February 4, 2010 agenda.

Ms. Bednaz noted that the public hearing is scheduled to close this evening. The Agency will need to decide whether to close or extend it. If it is closed, no additional information can be received.

Agent Peruta asked if all approvals need to be obtained by March 2, 2010.

Mr. Hawkes replied that they do not.

Chairman Maxellon noted that access for the maintenance of the basin on the east side of the bridge still needs to be addressed. He also added that he has heard from residents who are concerned that the bridge may, at times, be shut down.

Mr. Lemay stated that 2-way traffic on the bridge will be maintained at all times.

At this time the hearing was opened for public comment. No one in the audience came forward to speak for or against this project.

Ms. Bednaz recommended that the Agency not close this public hearing so that the final, updated plans can be received. She will provide proposed conditions of approval at the Agency's next meeting.

Mr. Hawkes requested an extension of the public hearing to the February 2, 2010 meeting.

At 8:24 p.m. a motion was made by Agent Camidge and seconded by Agent Lemay to accept the applicant's request to extend the public hearing to February 2, 2010 and table the public hearing to the meeting of February 2, 2010 at 7:00 p.m. in the Council Chambers. Vote was 7-0-0.

Agent Camidge left the room at 8:25 p.m. and returned at 8:26 p.m.

b. **IW-534- Enfield Properties** - is requesting a permit to construct two office buildings and five residential apartment buildings on vacant lots and 153 South Road (Map 55, Lots 80, 93 & 99), within the regulated area. Submitted 12/15/09, received 12/15/09, PPE 12/29/09, **MPHCD 2/23/09**. Frank Troiano, Dave Ziaks of F.A. Hesketh, Attorney Thomas Fahey, and George Logan, biologist and soil scientist from REMA Associates represented the applicant.

Mr. Troiano explained that the proposed project is for the construction of 2 commercial office buildings and elderly rental buildings containing 1 and 2 bedroom units.

The Planning & Zoning Commission, in the fall of 2008 changed their regulations to allow the elderly rental development.

Mr. Ziaks explained the proposal in further detail. He stated that the property is currently 3 existing lots, totaling 25.99 acres. Soil scientist Tom Pietras flagged the wetlands.

The 9.87 acres of wetlands follows no straight line. The property was previously used as farmland; the topography is mostly manmade over the past 40 to 50 years.

This is in a split zone, the easterly side being in zone R44 (40%) and the westerly size being in Industrial 1 (60%).

Five apartment buildings, 3 stories high with a total of 96 units are being proposed. Also, there would be 2 office buildings located along South Road.

The area in the southwest corner is more appropriate for a warehouse type building but the applicant has no plans for such a development at this time.

The apartments would have 148 parking spaces and the office buildings would have a total of 160 spaces.

The property is served by public water and sewer.

There would be 4,949 square feet of direct wetland disturbance, all in the R44 portion and 5.46 acres disturbance within the upland review area.

Mr. Ziaks provided an aerial photo of the site. The rear portion of the site is heavily wooded and will not be disturbed. The tree line follows and intermittent water course through the property.

Mr. Ziaks briefly explained the proposed storm drainage system. It will be a low impact design, including some pervious pavement, underground infiltration and numerous water quality basins, instead of just one large one.

There will be some sheet runoff instead of curbing and there will be no increase in peak runoff.

The watershed from the property heads west, eventually to Freshwater Brook.

Mr. Ziaks referred to the 40 scale plans named "GR-1" and "GR-2". GR-1 shows details of the proposed apartment buildings. The main driveway will be off of South Road. Wetlands, grading, and small retaining walls to minimize the footprint are included.

There will be a direct impact of 2,449 square feet to the wetlands for a crossing. The area would be filled in for a driveway and is in the location where a farm road has existed for many years.

There are also 2 isolated wetland pockets of 850 and 1,000 square feet and one small wetland to be filled in for construction of a fire lane. This fire lane would be gated on both sides.

The applicant is requesting that the Town Council approve abandonment of the paper portion of Barrett Road.

Because of the shape of the wetlands, most activities fall within the upland review area.

There is a larger wetland in the southerly portion but there will be no activity there, except for enhancement with plantings.

GR-2 is shows details of the I1 zone. It shows flagged wetlands and the proposed buildings. Most of the footprints of the buildings are outside of the upland review area but the driveway and parking areas are all within the upland review area.

The applicant proposes a conservation area of 5.5 acres in the R44 zone. It is anticipated that there will be additional conservation area on the industrial side but the exact amount is not known at this time.

Mr. Ziaks went on to state that there is no practical alternative for the wetland crossing. It is already a heavily disturbed area. There is not a watercourse through that area so a bridge or culvert is unnecessary. It is the same situation where the fire lane is proposed.

It is possible that the 2 isolated wetlands slated to be filled in are manmade, through farming activities.

Regarding feasible alternatives, Mr. Ziaks informed the Agency that there was a previously approved plan, in 1991, with the same type of split – 60%/40%. It was for 20 attached condominium units and two larger industrial buildings. That plan had more wetland impacts.

Another alternative would be for 3 residential lots. The rear of the property could not be accessed without additional crossings.

A third alternative would be to reduce the footprint of the proposed apartments down to 42 units, however the applicant feels that this would not be financially feasible or prudent.

He added that no matter which alternative is used, there is no way to access the rear portion of the property without a wetland crossing.

The applicant would like to move forward with the apartments immediately. The office buildings would be market driven. Currently, there is no interest or market for industrial buildings.

The applicant has resolved the fire chief's concerns by adding the additional fire lane.

Mr. Ziaks concluded by stating that the applicant will conclude the presentation this evening but hopes that the public hearing will remain open until the meeting of February 16, 2010. This will give the applicant time to adjust the plans to comments received and add mitigation, as well as work out all issues.

Mr. George Logan reviewed the plans from his perspective.

He stated that he saw the site in 1991 and again in late 2009 and early 2010. He will submit a comprehensive report to include impacts and mitigation.

The site has been in agricultural use for decades. Lateral ditches were dug to dewater the site. He will provide a report on the existing water quality conditions on site.

Mr. Logan stated that he feels that this proposal is the only alternative for development of the site. When visiting the site, he used the existing farm road at the site of the proposed wetland crossing.

Regarding the isolated wetlands, they have little, if any functionality.

Regarding the overall quality of the wetlands, some have quality – moderate to above average.

There are some invasives on site – purple loosestrife, autumn olive, phragmite.

In-kind mitigation will be provided. There are 3 areas proposed: one in an open field area, one triangular area and one near the proposed crossing. Together they equal approximately 4,900 square feet.

Mr. Logan will meet with Ms. Bednaz this week to discuss ideas for improvements to the remaining wetlands and removal of invasives.

Attorney Fahey explained that 2 areas of Barrett Road are within the upland review area. The Town will need to sign the application as well and Mr. Coppler has been given authority by the Town Council to do so.

He also noted that abandonment of the paper portion of Barrett Road will be on the Town Council's next agenda.

Ms. Bednaz referred to the ART notes provided to Agency members. She stated that she hasn't seen the proposed mitigation yet and will provide written comments once the plans have been received.

Ms. Bednaz also noted that the storm water management report has been submitted. She believes that storm water will be taken care of on site so that there should not be any impact downstream.

She also noted the need for applicants to make sure that the application is complete at the time of initial submission.

She added that the alternatives analysis should be provided in writing as part of the complete application. Also, she is waiting to see the rest of the whole application and will provide comment then.

Agent Camidge asked if the delineation of the wetlands was last done in 1991.

Mr. Ziaks replied that it was last done in 2009.

Ms. Bednaz noted that it should be on the plans. She added that she walked the site with Mr. Pietras. There were several marginal areas and she suggested that they be given attention, either by pulling the work back or providing mitigation.

Mr. Ziaks stated that the applicant has provided drainage calculations. The general flow is toward the center of the property and then flows to the west, through a 24" culvert then to an open channel, then through another culvert, through the industrial park and eventually into Freshwater Brook. It is a very gradual, slow movement. The intermittent channel on the site is the only well defined watercourse.

The areas for water quality basins will be sized for the area that each one covers; they will discharge into the wetlands.

On the commercial side, there will be larger detention basins and some underground storage. There will be no increase in runoff

Chairman Maxellon asked if any flow comes from the north side of the property.

Mr. Ziaks stated that it does not – it all comes from on site.

Mr. Jeffrey Bord, Town Engineer, noted that 4 of the 10 water quality basins are being used as detention basins, allowing for zero increase.

Ms. Bednaz noted that there is a culvert downstream that has flooding issues.

Mr. Board stated that the driveway holds up to a 25 year storm event; anything over that, water will top over the driveway.

Mr. Ziaks stated that, based on the condition of the driveway, this has probably never happened, however Mr. Troiano is offering to replace the driveway if the private owner agrees. It is not a public safety issue and there is no peak runoff increase.

Mr. Ziaks also stated that he will post the water quality plans on the FTP website.

Agent Peruta was concerned that the flow of water travels from west to south, the presentation given demonstrated that it flows from west to north which relieves his concerns. Properties to the south of site are currently experiencing stormwater issues and he was worried about compounding the problem.

Agent Peruta state that he didn't see mitigation measures proposed and was interested in seeing them.

Agent Peruta stated that he feels that he proposed conservation area is a great idea. Asked if public access has been considered

Mr. Ziaks agreed and added that there will be no mechanized access, perhaps only passive activity. State that language should be able to be added to the conservation language to allow public access for passive activities. Stated that 40% of the conservation area is uplands and 60% is wetlands.

Agent Peruta asked if any of the existing stockpile covers any wetlands.

Mr. Ziaks stated that whatever is there for a stockpile will be removed.

Mr. Logan added that the wetlands in that area are all in the forested portion.

Ms. Bednaz noted that one of the wetland flags goes right to one of the stockpiles. Recommended shown the pile locations on the plans.

Mr. Peruta stated that he wants to make sure that the stockpiles are not currently impacting wetlands. He is also concerned about the buffers because the buildings are proposed to be located right up to the edge of the wetlands. He will visit the site later this week. He also asked about snow stockpile areas.

Mr. Ziaks stated that he will provide a written plan. It is likely that the water quality basins will be used. This will allow for smaller piles, scattered around. Recommends that no salt be used, use sand and other methods because the salt can be a detriment to the concrete. Will put written now removal plan on plans.

Agent Peruta also stated that he likes the idea of porous pavement that is proposed and asked that the plans include maintenance for this.

Mr. Ziaks agreed to do so.

Agent Lemay asked that the type of fertilizers be included in the maintenance plans. Mr. Ziaks agreed to this request as well.

Agent Szczesiul noticed that the landscape plan for basin #5 includes invasive species.

Mr. Logan stated that he would look into this.

Agent Camidge noted that the road to the proposed commercial buildings area will be built but the applicant will not be building them immediately?

Mr. Troiano stated that the apartment buildings will be built first.

Agent Camidge expressed concern over the amount of wetlands that would be impacted. She noted that it is just under the 5,000 square feet that would require Army Corps of Engineers review.

She also noted that she is unfamiliar with having snow stockpiled in water quality basins.

Mr. Ziaks stated that there will be several small parking areas. It is not any different than local condominium projects. There will not be a lot of sand and salt used so there will be less contamination. A maintenance plan will be included.

Mr. Logan added that there are some types of salt that can be used. When there is a large stockpile of snow, a concentration of pollutants is created.

Using smaller piles, the concentration is spread out.

Agent Nelson asked if there would be a staging area for construction equipment and materials.

Mr. Ziaks stated that it will be added to the plans.

Agent Nelson asked, after noting the use of erosion control blankets at water quality basins #8 & #10 if there would be slopes of 3:1 or greater.

Mr. Ziaks replied that yes, there would. These basins will be partially excavated and partially created from the raised parking. There will be nothing steeper than 3:1.

Chairman Maxellon asked if there will be a maintenance plan for the detention basins.

Mr. Ziaks replied that it will be included in the plans and that snow will not be stockpiled in those locations.

Chairman Maxellon suggested the use of green roofs on the proposed commercial buildings.

Ms. Bednaz asked that the tree line be checked on the Barrett Road terminus.

She also noted that Mr. Cabibbo, Town Engineer, is opposed to using detention basins for snow stockpiles. She asked if this is the same for water quality basins.

Mr. Bord stated that the snow should not be stockpiled within the basins, but alongside, so that it melts into the basin.

Ms. Bednaz requested signage to alert contractors not to pile snow in the basins.

At this time, the hearing was opened for public comment.

Mr. Pat Sherman of 49 Barrett Road spoke of his concerns. There are several children in the area. He is glad there will be no access from Barrett Road.

He asked if there is any intention of opening the road.

Mr. Troiano replied that there is not.

Regarding Mr. Sherman's question on abandonment of the paper road, Mr.

Fahey explained that each of the 2 abutters of the roadway would own 25'.

Mr. Sherman also asked if the rail at the end of Barrett Road would remain.

He does not want traffic at the end of the road, or a place for parties.

He also asked if water going to the west and north would impact any neighbors.

Mr. Ned Belanger of 43 Barrett Road noted that one neighboring property is very wet due to the ditch being clogged. It needs to be cleaned out and possibly connected to one of the applicant's proposed basins.

He also asked about property setbacks.

Mr. Sherman asked for the definition of senior housing, if there are any time limits on the zoning limitations or income limits.

Mr. Matt Hebert of #51 expressed his concern over melt off from snow stockpiling entering into his back yard, saturating it. He stated that his backyard is already a bit wet.

Mr. Sherman asked why an emergency access from Barrett Road is necessary and asked for confirmation that there will be no traffic from this project on Barrett Road, even during construction.

Mr. Hebert asked for the definition of a culvert.

Mr. Fahey explained that the paper road abandonment would be forever. He encouraged the Barrett Road residents to ask the Town Council to support the request for abandonment.

He added that the amendment to the regulations allows for residents 62 and older. The property owner may be required to report to the Planning & Zoning Commission yearly. There is a deed restriction for the age restriction.

This property will be non-subsidized housing and apartments will rent at market rate.

Mr. Ziaks stated that he will look at the staging area again. With regard to the fire lane, most access will be off of South Road, with 2 roadways in. The fire department has requested a 3rd option and it works to the advantage of Barrett Road residents also. The road will be gated at both ends. He added that he feels that there is reasonable argument to abandon the paper street.

The conservation area will remain in private ownership.

Construction traffic will be banned off of Barrett Road. All construction traffic will come in through South Road.

A culvert is another name for a storm drainage pipe.

Mr. Ziaks stated that he will contact the 3 abutters attending this meeting to do a field walk with them.

Mr. Troiano again noted the importance of the neighbors' input on the abandonment of Barrett Road.

No one else in the audience came forward to speak for or against this application.

A motion was made at 10:16 p.m. by Agent Nelson and seconded by Agent Camidge to continue the public hearing to the meeting of February 16, 2010 at 7:30 p.m. in the Enfield Room. Vote was 7-0-0.

A recess was called by Chairman Maxellon at 10:17 p.m.

6. Call to Order of Regular Meeting: The regular meeting was called to order by Chairman Maxellon at 10:22 p.m.

7. Public Participation - Issues of concern not on the agenda: None.

8. Correspondence: None.

9. Commissioner's Correspondence
a. Site Visit Updates: Agent Lemay reported that the stone wall at the Enfield Medical Building is going up. The project seems to be moving quickly.

Chairman Maxellon reported that he and Agent Peruta recently attended the

Council of Chairs meeting. Agent Peruta gave a report on electronic packets. He will be meeting with the IT director regarding this.

Ms. Bednaz will continue to put as much of the information needed by the Agency members on the computer as possible.

The Plan of Conservation and Development update is on the Town's website.

Ms. Bednaz explained that the PZC procedure committee is working on their own and will share their template with the IWWA soon.

10. Approval of Minutes -January 5, 2009: A motion was made by Agent Nelson and seconded by Agent Camidge to approve the minutes of the meeting of January 5, 2010 with the following amendment: Change heading date from January 5, 2010 to January 2, 2010. Vote was 6-0-1(Albert)

11. Wetlands Agent Report: No written report was given. Ms. Bednaz explained that the office has been shorthanded so she has been unable to get out into the field. She asked that members check their sites and let her know of any issues that need her attention.

12. Old Business: None.

13. New Business: None.

14. New Applications to be Received

a. **IW - 453.05 - Town of Enfield** - Requesting modification to permit IW-453.04 to install rip-rap in defined locations. Project located within channel easement between Meadowlark Road to Yale Drive. Submitted 01/11/10, received 01/19/10, PPE 02/02/10, **MAD 3/25/10.** Mr. Jeff Board, Town Engineer, represented the applicant.

Mr. Bord explained that the applicant is requesting a revision to permit installation of rip rap in two areas being eroded by underground water flow. The channel project is complete.

Along 61-63 Broadleaf Lane, water is bleeding through approximately 40' on each side of the channel.

The same situation exists along 47-49 Yale Drive. The embankment is sloughing off, causing erosion.

In this area, a 30" pipe and yard drain work will be installed. Work has already begun and Mr. Bord hopes that it will be completed by the end of the week.

A stone berm is being used to hold back the disturbed areas.

Ms. Bednaz added that the reason for this modification is because of unanticipated breakout of groundwater. Rip rap is necessary to keep the soil in place.

Mr. Bord stated that the applicant will remove soil from the stream that was caused by the erosion.

Agent Albert asked if the same construction entrance would be used.

Mr. Bord stated that a new entrance will be used. The fence has been removed and a gate will be installed. This new site will be better than crossing the channel and creating more issues.

Agent Peruta asked if any erosion has been found on the inside of the channel at #49 Yale Drive.

Mr. Bord replied that no, the groundwater is coming from #47's direction.

Agency members discussed the potential need for a public hearing.

It was the unanimous consensus of the members that this is not a significant impact and a public hearing will not be necessary.

Mr. Bord stated that he will keep the IWWA informed and provide "as builts" once the project is completed.

b. IW-535 – Town of Enfield – is requesting a permit to replace a drainage pipe within an existing drainage easement to improve the drainage configuration in the area. (Map 37, Lots 4, 5 & 17) within the regulated area. Submitted 01/13/10, received 01/19/10, PPE 02/02/10, MAD 03/25/10: Mr. Jeffrey Bord represented the applicant.

Mr. Bord explained that the applicant proposes to replace a cross culvert on Parker Street. There is a constant flood problem at house numbers 23 and 25.

The site is 700' from Route 5. It drains south and north and enters Great Brook to the North. The area is a 16.88 acre watershed.

Currently there exist 12 and 15" pipes. The entire system is to be replaced.

To address flooding at #25, a 15" pipe will be replaced with a 24" pipe. The pipe will be pulled back 50' from the brook and rip rap installed in the channel.

Work will take place within the upland review area at the outlet.

Mr. Bord reviewed the profile plan. The outlet will have a lower velocity than it currently does.

This is a Capital Improvements Project and does not require permits from the D.E.P. or the Army Corps of Engineers.

The applicant plans to start construction in the spring of 2010.

There will be no disturbance to the property at #23.

In response to questions by Ms. Bednaz, Mr. Bord replied that the applicant will obtain a signature from the Sweetmans and sign-offs on the easement.

Agency members discussed the potential need for a public hearing on this application. Agents Peruta and Lemay felt that a public hearing is necessary, however the remainder of the Agency members felt that a public hearing is not necessary.

This application was received by the Agency and will in the future be known as XIW-10-01.

15. Other Business
a. IWWA Fines Ordinance
b. IWWA Fee Schedule
c. IWWA Regulation Revisions: A motion was made by Agent Camidge and seconded by Agent Lemay to table discussion on agenda items 15a, b, & c to the meeting of February 2, 2010.

d. **Next regular meeting is Tuesday, February 2, 2010 at 7:00PM in the Council Chambers.**

16. Adjourn: A motion was made by Agent Peruta and seconded by Agent Camidge to adjourn the meeting at 10:53 p.m. Vote was 7-0-0.

Respectfully Submitted,

_____

Jo-Marie Nelson, Secretary

Inland Wetlands and Watercourses Meeting

INLAND WETLANDS AND WATERCOURSES AGENCY
MINUTES OF A REGULAR MEETING
TUESDAY, February 16, 2010

A Regular Meeting of the Enfield Inland Wetlands and Watercourses Agency was held on Tuesday, February 16, 2010 in the Enfield Room, Enfield Town Hall, 820 Enfield Street, Enfield, Connecticut.

MEMBERS PRESENT:	Karen Camidge Maryann Abar, Alternate (seated) Joseph Albert Jo-Marie Nelson Brian Peruta Robie Staples Patrick Szczesiul, Alternate (seated)
MEMBERS ABSENT:	Douglas Maxellon, Chairman Robert Lemay
ALSO PRESENT:	Katie Bednaz, Wetlands Agent Susan Berube, Recording Secretary

REGULAR MEETING

1. Call to Order: The meeting was called to order by Vice Chairperson Karen Camidge at 7:31 p.m.

2. Roll Call: Present were: Vice Chair Karen Camidge and Agents Abar, Albert, Nelson, Peruta, Staples and Szczesiul. Also present were Katie Bednaz, Wetlands Agent and Susan Berube, Recording Secretary.

Agents Abar and Szczesiul were seated as full voting members for this meeting.

3. Pledge of Allegiance: The Pledge of Allegiance was recited.

4. Executive Session
(Matters regarding specific employees, pending litigation, acquisition of real estate and / or matters exempt from disclosure requirements): None.

5. Public Hearing
a. **IW-534- Enfield Properties** - is requesting a permit to construct two office buildings and five residential apartment buildings on vacant lots and 153 South Road (Map 55, Lots 80, 93 & 99), within the regulated area. Submitted 12/15/09, received 12/15/09, PPE 12/29/09, **MPHCD 2/23/10**: The applicant requested that this agenda item be taken up later in the

meeting due to their attorney being delayed. A motion was made by Agent Nelson and seconded by Agent Albert to move agenda item 5a out of order and be heard after agenda item 13a. Vote was 7-0-0.

6. Call to Order of Regular Meeting

7. Public Participation - Issues of concern not on the agenda: None.

8. Correspondence
   a. CT Federation of Planning and Zoning Agencies - 62nd Annual Conference
   b. IW-518 Petsmart Store Project Update Letter
   c. Article - Salt: No Easy Answers: Ms. Bednaz noted the need for education on the applicator's part.
   d. Letter from Groundwater & Environmental Services, Inc., dated 02/09/10 regarding test borings at the Exxon station located at 76 Hazard Avenue. Ms. Bednaz stated that she felt that no permit for this work is necessary since it is an extension of what has already been approved.

9. Commissioner's Correspondence
a. Site Visit Updates: Agents Peruta and Camidge gave brief reports.

Agent Peruta reported that the Villages subdivision project has not yet begun. It is under PZC appeal.

Agent Camidge reported that the silt fence is still down at both Five Guys Restaurant and Petsmart. She added that she felt that the condition of Five Guys looked worse at this visit. More soil has moved down toward the silt fence.

Ms. Bednaz stated that after the Agency's last meeting, she left a message with representatives from Five Guys but has not yet had a response. She is not very concerned at this point, but when the ground thaws, rain could allow mud to travel toward the wetlands at both locations. The hay bales at Petsmart are still doing their job, at least until the fence can be re-erected.

Agent Camidge also reported that she will be receiving the logo proof for the Agency's shirts, for review soon.

Agent Camidge also noted that she recently visited friends who live at Mr. Fortune's development. The friends have questions about the conservation easement and also mentioned that the neighbors behind them on Steele Road are cutting trees within the wetlands. The friends also have some plans for outdoor projects, such as installation of a shed or fence.

Ms. Bednaz stated that homeowners can always call her with questions. She also suggested that the friends put all of their plans for the next 5 years onto one permit application so as to save money on application fees.

Ms. Bednaz also noted the importance of contacting her quickly when someone notices clearing activity. One day can make a huge difference in damage control and restoration costs.

Agent Camidge asked if her comments at this meeting would constitute as notification to Ms. Bednaz regarding the cutting of trees within the wetlands behind her friends' home.

Ms. Bednaz replied that yes, it is considered notification and she will check into it.

Agent Camidge also noted that the IWWA phone list has a mistake on the Agent's phone number. The correct number is 253-6358, not 6368.

10. Approval of Minutes -January 19, 2010 & February 2, 2010: Agent Peruta reported that he had gone to the library to review the meeting of January 19, 2010, regarding the portion on IW-534- Enfield Properties. He requested that additional comments be added to the minutes.

Agent Albert asked if Agent Peruta's questions from that meeting will be addressed at this meeting also.

Ms. Bednaz replied that whether the questions were included in the minutes or not, if they were asked, the members should make sure that their questions are answered at a meeting.

A motion was made by Agent Nelson and seconded by Agent Peruta to table approval of the minutes of January 19, 2010. Vote was 6-0-1(Staples).

Agent Abar stated that she did not believe that she seconded a motion made on page 5, 4th paragraph and another on page 6, 3rd paragraph.

Agent Camidge noted a clerical error on page 8, 2nd paragraph, 2nd sentence: change "sate" to "state".

A motion was made by Agent Peruta and seconded by Agent Abar to table approval of the minutes of the meeting of February 2, 2010 to the meeting of March 2, 2010. Vote was 6-0-1(Nelson).

11. Wetlands Agent Report: Ms. Bednaz gave a brief verbal report. She reminded members, if interested, to sign up for the CAWS meeting to be held on February 23, 2010.

She noted that the Agency has planned a special meeting to discuss the regulations updates on February 25, 2010 at 7:00 p.m. Revisions made to date will be presented at that time. At this meeting, Ms. Bednaz hopes to complete the review of application requirements.

Ms. Bednaz also noted that she will have information at the meeting on how much and when fees were last changed.

Ms. Bednaz reported that the Meadowlark channel work is complete except for final grading, seed and mulch. Erosion and sediment controls are still in place.

12. Old Business: None.

13. New Business

a. **IW-535 - T.P. Rentals, LLC** - is requesting an amendment to the Town of Enfield Inland Wetlands and Watercourses Map for the property located on the south side of Hazard Avenue, immediately east of 150 Hazard Avenue (Map 74, Lot 118). Submitted 1/19/10, received 02/02/10, PPE 02/16/10, **MAD 4/8/10:** The applicant was not present and requests that a public hearing for this application be held at the March 16, 2010 meeting.

Ms. Bednaz stated that she has visited the site and conducted several soil tests. She recommends moving forward with the public hearing for the map changes.

A motion was made by Agent Nelson and seconded by Agent Albert to hold a public hearing for IW 535 at the regular IWWA meeting of March 16, 2010. Vote was 7-0-0.

b. **IW-534- Enfield Properties** - is requesting a permit to construct two office buildings and five residential apartment buildings on vacant lots and 153 South Road (Map 55, Lots 80, 93 & 99), within the regulated area. Submitted 12/15/09, received 12/15/09, PPE 12/29/09, **MPHCD 2/23/10**: Agent Staples recused himself from discussion on this application and left the meeting for the evening.

The public hearing began at 7:58 p.m.

Mr. Frank Troiano, Dave Ziaks, P.E., George Logan, soil scientist and biologist, and Attorney Thomas Fahey represented the applicant.

Mr. Troiano briefly reviewed the project, stating that the applicant proposes to construct 2 office buildings and 5 residential apartment buildings for seniors aged 62 and older. This will be a deed restricted use.

Mr. Ziaks, of F.A. Hesketh and Associates thanked the Agency for their patience in waiting for all of the applicant's representatives to arrive this evening.

He explained that the 2 commercial office buildings will be 20,000 square feet each.

Plans have been slightly modified. More information on storm water discharge and watershed has been provided on the plans.

Mr. Cabibbo has reviewed the modifications. There will be no runoff to the abutting properties or to the watershed to the south of the property. Runoff will go only to the Freshwater Brook watershed.

The applicant is trying to emulate the existing sheet runoff by utilizing small detention ponds instead of one large pond.

The applicant met with the neighbors who attended the public hearing held on January 19, 2010. They all walked the site and plans have been modified to add a landscape buffer and fencing, if the neighbors desire, after construction is complete. The applicant is also adding a drain which will connect to the project's discharge to relieve ponding in the neighbor's backyard.

Also, some small modifications to the residential area were made to improve separation between the improvements and wetland. The southwest corner of building #5 is now further from the wetlands. Also, a water quality basin was moved and another one was reconfigured to save 3 existing, mature trees. And, additional woodland was saved by reducing the size of another basin.

Landscape buffering has been added, as has a snow stockpile area.

Sheet NT1 shows the long term storm water maintenance plan. Mr. Ziaks suggested that this be enacted as part of the conditions of approval. He added that this has been done in the past.

Plans have been revised through 2/10/10 but have not yet been distributed to Agency members.

With regard to the second fire lane off of South Road, leading directly to the apartment complex, this was done at the request of the Fire Chief.

The applicant is currently proposing work in up to 3 phases. Phase one is the first two apartment buildings; phase two would be the remaining three apartment buildings and phase three would be the commercial buildings. The phasing would depend on market conditions. The plans show the snow stockpiles to fit with the phasing.

Landscape plans are now included, based on Mr. Logan's comments. They include wetland creation and mitigation to compensate for the loss of approximately 4,900 square feet of wetlands.

There is a loss 2,900 square feet of wetlands at the proposed crossing but

the remaining wetlands there will be enhanced and additional wetlands will be created from a small pocket of uplands.

The buffer will be enhanced as well.

Mr. Logan presented his report to the Agency. It includes photos, soil survey, plant list and a discussion of the existing and proposed wetlands.

Mr. Logan stated that he visited the site with Ms. Bednaz. 4,949 square feet of wetlands will be filled, half of which are small, isolated, mowed wetlands. The main impact will be to the area along the edge of the forest.

Between 2 lobes of wetlands is an area of uplands. Enhancement and restoration will be done. Invasive species will be removed and a scrub/shrub area will be created.

A shallow marsh area will be created.

Another wetland area has been mowed. It has little diversity and is flat. Trees will be added, along with perennials and shrubs. The top layer will be plowed and seeded to create diversity, and then left open.

A third area is an upland island of approximately 8 to 9,000 square feet. It is choked with invasives such as autumn olive. A marsh area will be created and will retain additional runoff from the stream running through this spot during larger storms.

A fourth area has a large population of spring peepers. It is currently 3" from being a wetland already and has vegetation that likes sandy areas. This is known as a New England sandy marsh, a critical habitat. The applicant is looking to create an area such as this.

The final area is an agricultural ditch, created to drain the field. The applicant proposes to reduce the number of purple loosestrife with biological means – beetles. Other invasives will be removed and the area enhanced with plantings.

A program will be in place so that every three or four years the woody vegetation will be removed to preserve it as a wet meadow. The plan LS-4 has details and notes for each area to be created or enhanced.

Regarding direct impact, Mr. Logan states he believes there will be a net enhancement because there will be .6 acres of enhancement and restoration.

Mr. Ziaks added that the applicant is also looking to create a 5.5 acre permanent conservation area in the residential area. It is a combination of uplands and wetlands. The third commercial development would also add conservation area at a later time, once it is determined if development will

take place. For now, that area will also act as a conservation area.

Ms. Bednaz stated that she has received the revised plans and drainage calculations. She will provide the first part to Agency members, unless a request is made for the entire package. Mr. Logan's report will be included in the next meeting packet.

Mr. Coppler, Town Manager, has signed off on a letter acknowledging that the application is being submitted. Along with a mitigation report it is now a complete application and this information will be provided in the next meeting packet.

Ms. Bednaz suggested that the proposed fencing along the neighbor's backyard be included in this permit application because it would be located within a regulated area.

She also noted that on the last page of the plans, the wetland lines appear to be off in the southern area.

Agent Peruta noted that there might be a few places like that.

Ms. Bednaz also stated that one purpose of phasing is to make sure that not too much land is open at one time during construction. The applicant needs to decide before IWWA approval if construction will take place with two or three phases.

The next regular IWWA meeting is scheduled for March 2, 2010, after the mandatory public hearing closure date of February 23, 2010. The applicant will need to request an extension if the public hearing is not to be closed at this meeting.

The Town Attorney recommends conservation restrictions, not conservation easements. The applicant will need to decide which is being presented.

Agent Peruta asked if Mr. Logan's report is similar to the one that he completed in 1991 for this site.

Mr. Logan replied that it is about 50%.

Agent Peruta stated that he walked the site and noticed bluebird houses. The old application had included a condition for bluebird houses.

Mr. Ziaks stated that the applicant does not know who erected the houses but they will be retained.

Agent Peruta asked if the enhancement planting plan is included in the notes.

Mr. Logan replied that is include on the plans, LS3 & 4.

Agent Peruta asked about the impact of this development.

Mr. Logan explained that in open areas with past disturbance, the rule of thumb is that undisturbed hedgerows are part of the interface protecting the wetland. As long as the buffer is undisturbed, there is usually no disturbance to the wetland.

If the forested buffer were being cut, creating an open area, then there would be big changes.

He also noted that the wetlands are located at the rear of the proposed buildings, giving them a more aesthetic value. The development has been pulled back so as not to impact the buffer.

Agent Peruta asked if there are any plans for access to the conservation area; it is a nice place to walk.

Mr. Logan stated that the applicant had been thinking of creating a loop for the residents; perhaps with a 4 to 5' wide path, kept open by periodic mowing.

Agent Peruta expressed his appreciation for the mitigation.

Mr. Troiano agreed that the loop is a good idea, it just has not been incorporated in the plans yet.

Agents Albert and Nelson requested that Mr. Logan point out on the aerial photo where the areas of mitigation, enhancement and restoration would be. Mr. Logan did as requested.

Agent Nelson asked if the yard drain is part of this application.

Ms. Bednaz stated that she would need to see where it is on the map.

Mr. Ziaks explained that it is a very small, simple pipe. The current topography doesn't allow their yard to drain. It is not a wetlands issue. The applicant may provide a drainage easement.

Ms. Bednaz asked if the plans specify the exact location of the pipes. He concern is that the neighbors' yards are not delineated for wetlands.

Agent Szczesiul noted that some of the proposed plantings are of non-native plants. He asked if these could spread, becoming a problem.

Mr. Logan stated that he hasn't scrutinized the plant list. His partner was impressed with the selection. Upon brief review, he stated that none that he sees are known to create a problem.

Agent Szczesiul also stated that he feels that the suggested trail would be great.

Mr. Ziaks stated that he is glad that the IWWA is in favor of the trail and that it will be relatively easy to do.

Agent Camidge noted that numerous changes to the plans have been discussed. She asked if a list of changes has been developed, making it easier to review the updated plans.

Mr. Ziaks replied that he will email a list to Ms. Bednaz on Wednesday.

Agent Camidge asked if there is a monitoring plan for the mitigation areas.

Mr. Ziaks replied that it is on page LS-4.

In response to another question, he stated that the snow stockpile area notes are also on the plans as are the details for the porous pavement and construction staging area.

Agent Camidge asked if the applicant will be cleaning out the neighbor's ditch that was noted at the 01/19/10 public hearing to be blocked with debris.

Mr. Ziaks stated that it is located right on the property line. There is a large tree growing in the ditch. The yard drain will take care of the drainage so that the ditch will not act as a ditch anymore.

Agent Camidge asked if a condition of approval should be added to address the fact that construction traffic will be banned from using Barrett Road.

Mr. Ziaks stated that it is already noted on the plans. PZC will likely require this as well.

Agent Camidge asked if the prudent and feasible alternatives analysis is in writing.

Ms. Bednaz replied that a written narrative has not been received.

Mr. Ziaks stated that a written narrative will be provided. He will also provide a letter requesting an extension to the meeting of March 2, 2010.

At 9:06 p.m., a motion was made by Agent Nelson and seconded by Agent Peruta to grant an extension to the public hearing for IW534 to the IWWA meeting of March 2, 2010. Vote was 6-0-0.

14. New Applications to be Received

a. Applications to be received after Town deadline for Agenda: None.

15. Other Business
a. IWWA Fines Ordinance
b. IWWA Fee Schedule
c. IWWA Regulation Revisions: A motion was made by Agent Albert and seconded by Agent Peruta to table discussion of agenda items 15a, b, & c to the special meeting of February 25, 2010. Vote was 6-0-0.

Ms. Bednaz stated that packets for the meeting of 03/02/10 will be distributed at the special meeting. Anyone not planning to attend the special meeting should let Ms. Bednaz know so that the packet can be mailed.

d. **Next regular meeting is Tuesday, March 2, 2010 at 7:00PM in the Council Chambers.**

16. Adjourn: A motion was made by Agent Albert and seconded by Agent Nelson to adjourn the meeting at 9:11 p.m. Vote was 6-0-0.

Respectfully Submitted,

_____
Jo-Marie Nelson, Secretary

Wetlands Agent Report

820 Enfield Street, Enfield, CT 06082
Phone: (860) 253-6355 Fax: (860) 253-4729
www.enfield-ct.gov

Town of Enfield
Planning Department

Memo

To: Enfield Inland Wetlands and Watercourses Agency
From: Katie Bednaz, Assistant Town Planner/Wetlands Agent
Date: February 24, 2010
Re: Wetlands Agent Report

Site Visits

123 Weymouth Road – Inspected per concern of tree clearing in the regulated area. See correspondence in packet for findings.

201 State Street – Application filed for tree clearing (after the fact) and shed in regulated area, see packet.

Agent Approval

Pending – AAA-077 - Five Guys Burgers and Fries. Requesting a 12' x 16' shed be placed between the parking area and detention pond. Located in URA, 65-feet from wetland.

Other Topics

A. **CAWS Annual Meeting** – Attended this meeting which had many good presenters and handouts. Presented information on legal cases, vernal pool monitoring and studies, etc. I will gather the handouts and distribute them in a later packet, since this one is somewhat full already.

B. **Petsmart** – Requesting a Certificate of Occupancy for their building, hoping to open 3/1/10.

201 State St.
IW# 536

TOR

③
N/F
CARL NELSON
CONSTRUCTION, INC.

516.68' (TOTAL)

N15°15'00"W

CONSERVATION
EASEMENT

④
73,087 S.F.
1.6778 AC.

FLOOD
LIMIT LINE

W10

APPROX. LIMIT

W11

OF WETLANDS

W12

N67°00'00"E 24.30'

25' S.Y.

100' WETLAND BUFFER

200.02'

30' Shed Set

12 FT

PROPOSED TREELINE
LIMIT OF clearing

101

Actual
Clearing
Limit

N45°00'00"E 130.57'

EXIST. TREELINE

ELEC. METER

8FT CONC. DRIVE

102.9'

WOOD PORCH & STEPS

45.4'

103.3'

25.4'

50.3'

102

1.2' ROOF O/H

EXISTING HOUSE

105

104

106

50.3'

25.4'

1.0
HO
O/I

40'

WOOD DECK

12.5'

LP TANK

102

103

FL=101.8

RIP RAP

54.8'

Swing Set

(EASE)
Δ=1°58'21" R=5
L=192.95' T=

IW#536

TOWN OF ENFIELD
INLAND WETLANDS & WATERCOURSES AGENCY
PERMIT APPLICATION & CHECKLIST

INSTRUCTIONS:

1. The Agency and the applicant may hold a pre-application meeting to examine the scope of a proposed regulated activity or to determine if the proposed application involves a significant activity.

2. Any person intending to undertake a regulated activity shall apply for a permit by completing the applicable parts of this nine-page application form (consisting of parts A, B, C & D).

3. For the purpose of this application:
   a. "applicant or person" means any person, persons, firm, partnership, association, corporation, company, organization or legal entity of any kind, including municipal corporation, governmental agency or subdivision thereof; and
   b. refer to the Town's Inland Wetlands and Watercourses Regulations for further clarification and guidance with respect to the standards and criteria used for application evaluation.

___ 4. ~~Nine (9)~~ 11 copies of all applicable completed application materials shall be submitted unless otherwise directed in writing by the Agency or its designated agent.

___ 5. Indicate which of the following circumstances fit this application and comply with the following referenced application requirements.

CIRCUMSTANCES	CHECK	REQUIREMENTS
Application for regulated activity		Complete Part A only
Application also involves Site Plan, Subdivision, or Special Permit		Complete Parts A & B
Application involves a Significant Activity		Complete Parts A, B & C
Renewal or Extension for, or Amendment to an Issued Permit		Complete Part D only
Wetland Map Amendment		Complete Part E only

✓ ___ 6. Applicant's Name: Richard Lanagan

✓ ___ 7. Address or descriptive location (e.g. north side of Hazard Ave. – 1,000 feet easterly of intersection with Palomba Dr.) of proposed regulated activity:
701 STATE ST
Enfield CT 06082

___ 8. Title of Project: Shed / Land clearing

RECEIVED
FEB 22 2010
PLANNING OFFICE
ENFIELD, CT

1 022210 0000394 001 MAP PERMIT $135.00

TOWN OF ENFIELD
INLAND WETLANDS & WATERCOURSES AGENCY
PERMIT APPLICATION & CHECKLIST

PART A

All applications for regulated activities shall include the following information:

___ A. Applicant's name: Richard Lanagan

___ B. Applicant's address: 201 State St
Enfield Ct. 06082

___ C. Applicant's phone number: 860-614-0834

___ D. Applicant's interest in the property:
Landowner

___ E. Landowner's name: Same

___ F. Landowner's address: Same

___ G. Landowner's telephone number: Same

___ H. Written consent (dated and signed) from the landowner that expresses his knowledge of and consent to the application if the landowner is not the applicant.

___ I. The total calculated area (in square feet) of wetlands and watercourses on the subject property: ~27,600 square feet.

___ J. The total calculated area (in square feet) of regulated area that would be disturbed by the proposed regulated activities (include regulated areas that provide access to and ample space to work around the regulated activities): ~7600 square feet.

✓ ___ K. Submission of the appropriate application fee based on the fee schedule established in Section 19 of the regulations.

✓ ___ L. Written narrative of sufficient detail that sets forth the purpose and a description of the proposed activity and alternatives considered by the applicant and why the application's proposal to alter the wetlands or watercourse was chosen.

___ M. A location map at a scale of 1 inch = 2,000 feet identifying the geographical location of the property involved.

✓___ N. A map at a scale of 1 inch = 100 feet identifying the geographical location of the property to be affected by the proposed activity, adjacent lands, adjacent regulated areas, such upstream and downstream areas as may be identified by the Agency or its designated agent, and other pertinent features including, but not limited to, existing and proposed property lines, roads and drives, existing buildings and their utilities, topography, soil types from the published soil survey, the limits of inland wetlands, watercourses and conservation buffer areas, existing and proposed lands protected as open space or by private conservation easements, and types of vegetative cover.

✓___ O. A site plan at 40' scale that provides sufficient detail showing existing and proposed conditions, including maximum building areas, in relation to regulated areas and measures proposed to mitigate the potential environmental impacts.

___ P. A title block and legend of symbols used for each plan or map indicated the name of the project, landowner and applicant, name and signature of the person preparing the plan or map, date prepared and subsequent revision dates and scale.

Q. Certification as to each of the following:

___ (1) Is any portion of the wetland or watercourse (on which the regulated activity is proposed) located within 500 feet of the boundary of an adjoining municipality?
____Yes No ✓
Name of Town(s):_____

___ (2) Will traffic (attributable to either construction activities or to the completed project on the site) use streets within the adjoining municipality to enter or exit the site?
____Yes No ✓
Name of Town(s):_____

___ (3) Will sewer or water drainage from the project site flow through and affect the sewage or drainage system within the adjoining municipality? ____Yes No ✓
Name of Town(s):_____

___ (4) Will water runoff from the improved site affect streets or other municipal or private property within the adjoining municipality? ____Yes No ✓
Name of Town(s):_____

___ R. If yes to the aforementioned question Q.(1), then provide documentation (copy of return receipts) that the applicable adjacent municipal wetland agencies were duly notified pursuant to the regulations.

___ S. Copy of the STATEWIDE INLAND WETLAND ACTIVITY REPORTING FORM (attached) with all applicable sections completed by the applicant.

____ T. Names and addresses of abutting property owners as shown in the records of the tax assessor of the municipality as of a date no earlier than thirty (30) days before the date the application is submitted.

____ U. Any other information the Agency or its designated agent deems necessary for the review and evaluation of the application.

_____

_____

____ V. Does this application include any regulated activity in a Floodplain?

☐ Yes – Please fill out Development Permit for Flood Hazard Areas
☑ No – Proceed to next question.

____ Certification By Applicant

By my (our) signatures, I (we) hereby certify that:

i. the applicant(s) is (are) familiar with all of the information provided in the application and is (are) aware of the penalties for obtaining a permit by deception or by inaccurate or misleading information; and

ii. the Agency members and their designated agents are authorized to inspect the property, at reasonable times, both before and after a final decision has been issued, and after completion of the project.

SIGNATURE(S) OF APPLICANT(S): DATE:

Richard T. Z [signature] 2-21-10

_____ _____

_____ _____

FEES

18.1 The Agency shall collect the following fees to help defray the costs and expenses of carrying out its duties under these regulations. No application shall be granted or approved by the Agency unless the correct application fees have been paid, or a waiver of such has been granted.

Fee for Activities:

$ 15.00	Determination of Permit Need (DPN) (Jurisdictional Ruling)
$ 70.00	Agent Approval Application (Amend. Effective Date: Feb 4, 2004)
$ 75.00	Base Fee for Individual Home Owner and Agricultural Actives Requiring a Permit
$150.00	Base Fee for All but Above. (DPN fee will be deducted, if a permit is deemed necessary.)
$ 75.00	Revisions to Existing Permits (i.e., alterations to conditions).

The following will be added to the above fees:

~~$ 30.00~~ $60	State Permit Fee (amend Effective Date Feb 4, 2004)
$150.00	Wetlands Map or Regulation Revisions
$125.00	For Each Proposed Additional Point of Impact to Wetlands beyond One (Temporary Soil and Erosion Control Points of Contact will be Exempt.)

Boards, Commissions, Agencies, and Departments of the Town of Enfield are exempt from all fee requirements.

18.2 As a condition of any permit, the Agency may require that the applicant engage and pay for an independent consultant to report to the Agency the results of project monitoring and/or inspections. The consultant must be pre-approved by the Agency, and said consultant shall monitor and/or inspect on a schedule determined by the Agency.

a. The consultant shall send written reports on performance on a schedule determined by the Agency simultaneously to both the Agency and the Office of Planning and Community Development, Town of Enfield, 820 Enfield Street, Enfield, Connecticut, and to the applicant.

CONNECTICUT DEPARTMENT OF
ENVIRONMENTAL PROTECTION
79 Elm Street
Hartford, CT 06106-5127

Arthur J. Rocque, Jr., Commissioner

GIS CODE #: _____
For DEP Use Only

Statewide Inland Wetlands & Watercourses Activity Reporting Form

Please complete this form in accordance with the instructions. Please print or type.

PART I: To Be Completed By The Inland Wetlands Agency Only

1. DATE ACTION WAS TAKEN: Year _____ Month _____
2. ACTION TAKEN: _____
3. WAS A PUBLIC HEARING HELD? Yes _____ No _____
4. NAME OF AGENCY OFFICIAL VERIFYING AND COMPLETING THIS FORM:

   (print) _____ (signature) _____

PART II: To Be Completed By The Inland Wetlands Agency Or The Applicant

5. TOWN IN WHICH THE ACTION IS OCCURRING: Town of Enfield

   Does this project cross municipal boundaries? Yes _____ No ✓

   If Yes, list the other town(s) in which the action is occurring: N/A, _____
6. LOCATION: USGS Quad Map Name: Springfield South ***AND*** Quad Number: 8

   Subregional Drainage Basin Number: 4000
7. NAME OF APPLICANT, VIOLATOR OR PETITIONER: Richard Lanagan
8. NAME & ADDRESS/LOCATION OF PROJECT SITE: 201 State Street

   Briefly describe the action/project/activity: Clearing w/in regulated area + const. of shed
9. ACTIVITY *PURPOSE* CODE: A
10. ACTIVITY *TYPE* CODE(S): 12, 3, _____, _____
11. WETLAND / WATERCOURSE AREA ALTERED [must be provided in acres or linear feet as indicated]:

    Wetlands: 0 acres Open Water Body: 0 acres Stream: 0 linear feet
12. UPLAND AREA ALTERED [must be provided in acres as indicated]: .174 acres
13. AREA OF WETLANDS AND / OR WATERCOURSES RESTORED, ENHANCED OR CREATED: .1-0 acres
    [must be provided in acres as indicated]

DATE RECEIVED: **PART III: To Be Completed By The DEP** DATE RETURNED TO DEP:

FORM COMPLETED: YES NO FORM CORRECTED / COMPLETED: YES NO

February 17, 2010

Dear Wetlands Committee,

I'm writing in regards to explain our situation at 201 State Street, Enfield, Connecticut. We just recently purchased this property and in the early to late fall we chose to clear a small portion of our backyard not realizing that we cleared some of the land considered to be in the Upland Review Area. The conservation easement markers **were** not observed due to the two different plans: the as-built and the approved plans. The proposed tree line shown on as-built varies from approved plans that show limit of clearing (label varies). The as-built conservation easement does not match conservation easement shown on approved plans dated 11-25-05, revised to 3-10-06.

The reason for clearing some of the land was to get rid of dead trees (approximately 4-5), to rid the area of overpowering and entangled large vines and debris, and to basically make the area more livable to our outdoors kind-of-lifestyle. We are also looking to put up a shed in our backyard with respect to the Conservation/Wetlands area.

With that being said, our intentions with our property is one in which we plan to:

1. plant grass in the area cleared in the spring
2. plant native trees/shrubs in the areas that need to be left in conservation (if applicable)
3. promote new growth
4. remove the silt debris
5. maintain the hay bales that have ALREADY been placed in the Wetland buffer until exposed soils are stabilized; upon stabilization the erosion controls will be installed

Our plans for our backyard will and are being immediately carried out and should hopefully be resolved by the summer of 2010. We will be working diligently with your staff as well as ourselves to preserve what rightfully needs to be preserved.

We thank you for your time and for your understanding.

Respectfully yours,

Debbie Lanagan

Richard & Debbie Lanagan

Immediate abutters:

Matthew Burlingame
Michelle Zimmer
205 State St.
Enf. CT

INSTR # 2010001047 VOL 02494 PG 0738 RECD 08/19/2009 10:58:31 AM
SUZANNE F. OLECHNICKI, TOWN CLERK ENFIELD CT LAND RECORDS
TOWN CONVEYANCE TAX RECEIVED 580.00 STATE CONVEYANCE TAX RECEIVED
1,160.00

STATUTORY FORM WARRANTY DEED

TO ALL PEOPLE TO WHOM PRESENTS SHALL COME, GREETING:

KNOW YE, that, **CARL NELSON CONSTRUCTION, INC.**, a Connecticut corporation with an office in the Town of Ellington, County of Tolland and State of Connecticut hereinafter referred to as the Grantor, for the consideration of **TWO HUNDRED THIRTY-TWO THOUSAND DOLLARS ($232,000.00)** received to its full satisfaction of **RICHARD T. LANAGAN III** and **DEBRA M. LANAGAN**, of the Town of Enfield, County of Hartford and State of Connecticut, hereinafter referred to as the Grantees, do give, grant, bargain, sell and confirm unto the said Grantees and to the survivor of them, and their heirs, successors and assigns forever, **WITH WARRANTY COVENANTS**

A certain piece or parcel of land designated Lot 4 on a map or plan entitled, "Subdivision Plan Lot 240-State Street Prepared for Carl Nelson Enfield, Conn. Rev. 7-28-06 Rev. 6-20-06 P&Z Approval Comments Rev. 3-10-06 Wetland Approval Comments Rev. 2-27-06 Staff Comments Rev. 2-2-06 Staff Comments Aeschliman Land Surveying, PC 1379 Main Street East Hartford, Conn. 06108 (860)-528-4881 Date: 11-25-05 Scale: 1"= 40' Map No. 205081-1 Sheet 1 of 4" which map or plan is recorded in the Town Clerk's Office of the Town of Enfield, to which reference may be had.

Portions of said property containing steep slopes, wetlands or watercourses are therefore subject to Enfield Inland Wetlands and Watercourses regulations as amended. Disposing of leaves, grass clippings, brush or other lawn refuse, screening, filling or other modifications shall not be made to the portion of this property that is encumbered with a conservation restriction, which restriction is recorded in the Town Clerk's Office of the Town of Enfield.

Said premises are conveyed subject to any and all provisions of any ordinance, municipal regulation and public or private law.

Said premises are further conveyed subject to easements as of record may appear. In addition, the Grantor reserves the right to grant an easement to the Connecticut Light & Power Company in the future, in accordance with the aforementioned subdivision plan.

Said premises are further conveyed subject to real estate taxes due the Town of Enfield on the List of October 1, 2008, which taxes the Grantee herein assumes and agrees to pay as part consideration for this deed.

Being a portion of the premises conveyed to the Grantor by Warranty Deed from Joyce P. Babiarz and Matthew W. Pierog, Jr., dated November 23, 2005, and recorded in Volume 2101 at Page 112 of the Enfield Land Records.

IN WITNESS WHEREOF, CARL NELSON CONSTRUCTION, INC., has hereunto set its hand and seal this 18th day of August, 2009.

Signed, sealed and delivered
in the presence of:

Miranda L. Hunter

Deborah W A Eliason

CARL NELSON CONSTRUCTION, INC.

BY _____
CARL S. NELSON
ITS PRESIDENT

STATE OF CONNECTICUT)
) ss: Enfield August 18, 2009
COUNTY OF HARTFORD)

Personally appeared before me Carl S. Nelson, President of Carl S. Nelson Construction, Inc., known to me to be the person described in the foregoing instrument, and who acknowledged that he executed the same in the capacity therein stated and for the purposes therein contained. In witness whereof I hereunto set my hand,

Deborah W. A. Eliason
Commissioner of the Superior Court

Grantee's Address:
201 State Street
Enfield, CT 06082

Need to Send

TOWN OF ENFIELD
PLANNING & COMMUNITY DEVELOPMENT

MEMO

TO: All applicants to the Enfield Planning & Zoning Commission. the Enfield Inland Wetlands & Watercourses Agency, & the Enfield Zoning Board of Appeals
FROM: Enfield Planning & Community Development Department
DATE: 2002
SUBJECT: Notice to Water Companies about projects within their watersheds

CGS 8-3I & CGS 22a-42f require applicants to the above agencies to contact any water company or companies within whose watershed [s] the proposed activity will occur. The statutes do not require the Town of Enfield to accept and transmit that notice to the water companies. However, in a continuing effort to assist applicants with their responsibility to notify water companies of proposed projects, the Connecticut General Statute covering that requirement is herein provided.

CGS Sec. 8-3i. Notice to water company re projects within aquifer protection area or watershed of water company. (a) As used in this section "water company" means a water company as defined in section 25-32a and "petition" includes a petition includes a petition or proposal to change the regulations, boundaries or classifications of zoning districts."
(b) When an application, petition, request, or plan is filed with the zoning commission, planning and zoning commission or zoning board of appeals of any municipality concerning any project on any site which is within the aquifer protection area delineated pursuant to section 22a-354c or the watershed of a water company, the applicant or the person making the filing shall provide written notice of the application, petition, request or plan to the water company, provided such water company has filed a map showing the boundaries of the watershed on the land records of the municipality in which the application, petition, request or plan is made and with the zoning commission, planning and zoning commission or zoning board of appeals of such municipality or the aquifer protection area has been delineated in accordance with section 22a-354c, as the case may be. Such notice shall be made by certified mail, return receipt requested, and shall be mailed within seven days of the date of the application. Such water company may, through a representative, appear and be heard at any hearing on any such application, petition, request or plan.

(c) Notwithstanding the provisions of subsection (b) of this section, when an agent of the zoning commission, planning and zoning commission or zoning board of appeals is authorized to approve an application, petition, request or plan concerning any site which is within the aquifer protection area delineated pursuant to section 22a-354c or the watershed of a water company without the approval of the zoning commission, planning and zoning commission or zoning board of appeals, and such agent determines that the proposed activity will not adversely affect the public water supply, the applicant or person making the filing shall not be required to notify the water company.

CGS Sec. 22a-42f. Notice of application to water company re conduct of regulated activities within watershed of water company. When an application is filed to conduct or cause to be conducted a regulated activity upon an inland wetland or watercourse, any portion of which is within the watershed of a water company as defined in section 25-32a, the applicant shall provide written notice of the application to the water company provided such water company has filed a map showing the boundaries of the watershed on the land records

of the municipality in which the application is made and with the inland wetlands agency of such municipality. Such notice shall be made by certified mail, return receipt requested, and shall be mailed within seven days of the date of the application. The water company, through a representative, may appear and be heard at any hearing on the application.

Applicants should note the specific requirements contained in the statute:

1. **Written notice to the involved Water Company within seven (7) days of submittal of any application, petition, request, or plan to the Town of Enfield.**
2. **Notice to the Water Company by the applicant is to be by certified mail, return receipt requested.**

Two companies currently supply water within the Town of Enfield – The Connecticut Water Company and The Hazardville Water Company. Level 'A' and Level 'B' watershed maps have been supplied by The Connecticut Water Company, Level 'B' maps by The Hazardville Water Company. Those received to 1/14/2002 are on file with the Town of Enfield.

A copy of any site plan submitted with the application to any of the above commissions or board should be submitted with the official notice to the water company or companies involved. It would also be helpful to include a location map with the notice to facilitate the review by the water company.

In some instances, such as any preliminary Administrative Review Team meeting, applicants will be specifically informed of this notice requirement. However, under all circumstances, **it is the sole responsibility of the applicant to ensure notice to the water company or companies**. Confirmation of timely notice [by copy of the signed certified mail return receipt] should be transmitted to this department for inclusion in the application file for the knowledge of the commissions or board.

Connecticut Department of Public Health
Drinking Water Section

Public Water Supply Watershed or Aquifer Area Project Notification Form

REQUIREMENT:

Within seven days of filing, all applicants before a municipal Zoning Commission, Planning and Zoning Commission, Zoning Board of Appeals or Inland Wetlands Commission for any project located within a public water supply aquifer or watershed area are reguired by Public Act No. 06-53 of the CT General Statutes to notify The Commissioner of Public Health and the project area Water Company of the proposed project by providing the following information.

To determine if your project falls within a public water supply aquifer or watershed area visit the appropriate town hall and look at their *Public Drinking Water Source Protection Areas* map. If your project falls completely within or contain any part of a public water supply aquifer or watershed you are required to complete the following information.

Note: You will need information obtained from the *Public Drinking Water Source Protection Areas* map located in the appropriate town hall to complete this form.

WEB SITE:

http://dph.state.ct.us/BRS/Water/Source_Protection/Web_form.htm

Public Water Supply Watershed or Aquifer Areas
Project Notification Form

Requirement:
All applicants before a municipal Planning and Zoning Commission, Inland Wetland Commission or Zoning Board of Appeals for any project located within a public water supply aquifer or watershed area are required by Section 8-3i of the CT General Statutes (as amended by PA 98-115) to notify the affected water utility by certified mail within 7 days of the date of the application.

General Information:

1. Location map of the project site (please show enough information to locate site).

2. Site plans including soil erosion and sediment control plan which have been submitted to the town commission for review.

3. Project address 201 State Street

4. Total acreage of project site 1.678 acreage

5. Existing land use residential

6. Project description clearing of land and placement of shed all within Upland Review Area

7. Acreage of are to be disturbed including structures, additions, paving, and soil disturbance 8,400 square feet

8. Type of sanitary system (circle one)- septic system / public sewer/both/none

9. Number of existing or proposed floor drain and their point of discharge e.g. sanitary sewer, holding tank, or ground NA

10. Water accessed by (circle one)- private well/public water/other/none;
If other, please specify

11. Distance of site disturbance to nearest watercourse or wetland 10 feet

12. Brief description of existing or proposed stormwater management system, including roof drainage, paved areas etc., and discharge points e.g. municipal sewers, drywells, streams, vegetated areas, detention basins etc. Single-family lot w/ no formal drainage system

13. Type of heat for facility N/A

14. List of existing and proposed underground or above-ground storage tanks including age, capacity and contents NA

15. List of potentially harmful chemicals stored or used on property (existing and proposed) and typical onsite volumes, including but not limited to petroleum products, lubricants, solvents, detergents and pesticides NA

16. Describe any wastes generated and their means of disposal Public Sewer.

17. Date application will be heard by Planning and Zoning Commission NA

18. Date application will be heard by Zoning Board of Appeals NA

19. Date application will be heard by Inland Wetlands Commission 3/2/10

20. Name, address and telephone number of contact person for the project 860-614-0834

Richard Lanagan, 201 State Street, Enfield, CT

Debra Lanagan — Debra Lanagan — 2.22.10

Name of person completing form — Signature — Date